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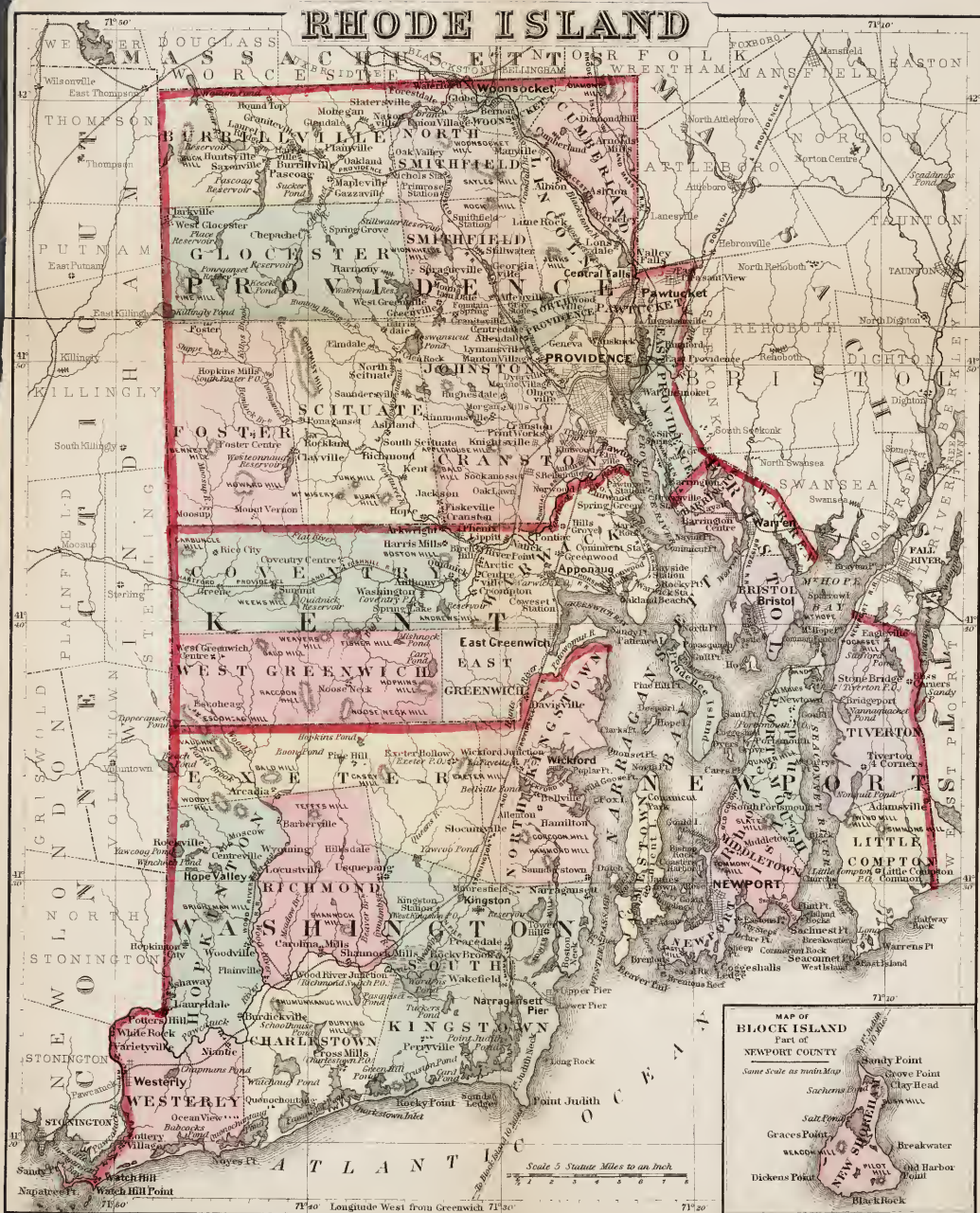
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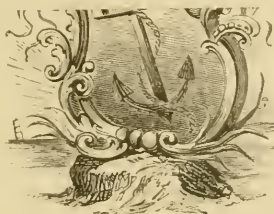
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FIRST ANNUAL REPORT
OF THE
STATE BOARD OF HEALTH
OF THE
STATE OF RHODE ISLAND.

With the compliments of
Secretary of the State Board of Health,
Office 17 College St., Providence, R. I.



PROVIDENCE:
E. L. FREEMAN & CO., PRINTERS TO THE STATE.
1879.

FIRST ANNUAL REPORT
OF THE
STATE BOARD OF HEALTH
OF THE
STATE OF RHODE ISLAND,
FOR THE
YEAR ENDING DEC. 31, 1878.



PROVIDENCE:
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MEMBERS

OF THE

RHODE ISLAND STATE BOARD OF HEALTH,

WITH P. O. ADDRESS AND TERMS OF SERVICE.

	<i>P. O. Address.</i>	<i>Term Expires.</i>
DAVID KING, M. D.....	Newport.....	1884.
HON. ELISHA DYER, Jr.....	Wakefield	1883.
CHARLES H. FISHER, M. D.....	Scituate	1882.
GEORGE W. JENCKES, M. D.....	Woonsocket	1881.
WILLIAM T. C. WARDWELL, Esq....	Bristol.....	1880.
ALBERT G. SPRAGUE, M. D.....	Centreville	1879.

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To the Members of the Rhode Island State Board of Health :

GENTLEMEN:—An account of the more important transactions of the Board, and the work of the Secretary, during the eight months ending December 31, 1878, is respectfully presented in the general report herewith submitted.

The organization of a new department of State administration in all cases, necessarily involves the employment of considerable time, in acquiring a full knowledge of the duties of that department, and in the devising of methods of systematic administration. Some part of the work assigned the Secretary of the Board had been previously performed in several diverse departments of the civil government, and, therefore, the labor required, to attain a familiar acquaintance with all the details of these different forms of service, and to discharge the duties appertaining thereto, together with the new duties imposed by the Act establishing the Board, has given quite full occupation to the time of your Secretary since his appointment to the office.

The work has been performed in three departments of labor, which, though having many points and objects in common, have still, in several respects, distinctly separate purposes and modes of procedure. And though there is a unity in the whole, in regard to the objects to be attained, there must continue to be the same general division. The three departments comprise the investigation of the causes of disease, the superintendence of the collection, classification and tabulation of vital statistics, and the work of the Cattle Commission.

In the report will be found suggestions and remarks in regard to the several departments of labor, and the plans with which the work is designed to be prosecuted, and which seem to promise the best results.

The several papers, which are added to the report, are all of a practical character, and the information they will furnish, on all the subjects treated, will be of substantial value to all who study them.

CHARLES H. FISHER, *Secretary.*

PROVIDENCE, January 19, 1879.

PROVIDENCE, R. I., January 22, 1879.

*To the Honorable, the General Assembly of the State of Rhode
Island:*

In compliance with the provisions of Chapter 680, of the Public Laws, the State Board of Health herewith respectfully presents the accompanying report of the Secretary, and appended papers, as the Annual Report of the Board, for the year ending Dec. 31, 1878.

DAVID KING, *Chairman.*

CHARLES H. FISHER, *Secretary.*

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REPORT OF THE SECRETARY.

I have the honor herewith to present my first Annual Report, as Secretary of the Rhode Island State Board of Health.

As an introductory to a clerical report of the doings of the Board, and the work of the Secretary, a brief history of the inception, and progress of the movement, which resulted in the Act of the General Assembly, establishing a State Board of Health, will be quite pertinent.

ORIGIN OF THE BOARD.

On the last day of the May session of the General Assembly for the year 1877, a bill to establish a State Board of Health, was introduced in the Senate, and was referred to the Committee on the Judiciary. The framing of the bill was the result of a sudden impulse to bring the question squarely before the public, during the recess previous to the January session of the year 1878. There was no expectation that the bill would go through the hands of the committees of both houses, and be put on its final passage in both on that day, but that it would go over to the next session as unfinished business.

The provisions of the bill, framed without access to any legislation of like character, were few, but the desired object was quite as well accomplished. At the January session of the General Assembly for the year 1878, the bill came up as unfinished business, and was transferred from the Committee on the Judiciary of the House, in whose docket it then was, to the House Committee on State Charities and Corrections. That committee, in conference with Dr. E. M. Snow, Superintendent of Health, of the City of Providence, a Committee of the Providence Medical Association, and the Senator who presented the original bill, framed a new bill, which was reported to the House by them, as a substitute for the bill referred to them.

Previous, however, to any active movement by the Committee on State Charities and Corrections, in the direction of framing a new bill, the Governor had received a communication from the Secretary of the International Medical Congress of 1876, enclosing a resolution of that body directed to the Governors of all the States, earnestly requesting them to recommend to their respective legislatures the enactment of laws establishing State boards of health, whenever such boards of health had not already been established. This communication was presented, and referred by the Governor to the Joint Committee on Executive Communications. That committee made the following Report.

REPORT OF THE JOINT COMMITTEE ON EXECUTIVE COMMUNICATIONS.

To the Honorable General Assembly :

The joint committee on executive communications, to whom was referred a "Circular and Resolutions of the International Medical Congress in relation to the establishment of State Boards of Health," respectfully report that they requested Dr. Charles H. Fisher, a member of said committee to prepare a paper on the general subject of State Boards of Health, which is herewith submitted and is as follows :

Mr. Chairman and Gentlemen of the Committee :

In compliance with your request, I herewith submit some suggestions, touching the questions involved in the communication of his excellency, the Governor, of a circular and resolution of the International Medical Congress, in relation to the establishment of State boards of health.

The first question which naturally presents itself, is the one of practical utility,

IS A STATE BOARD OF HEALTH NEEDED ?

If answered in the affirmative, then follows the question: what are the reasons for so believing ! In order to intelligently consider the question, it is necessary, first to make a statement of facts, appertaining to the general public, in relation to health and life, and their influences, social, civil and political. The value of public health can scarcely be overestimated. It is the absolutely indispensable foundation, of a vigorous and prosperous state. .

PUBLIC HEALTH IS PUBLIC WEALTH,

said the statesman and philosopher, Benjamin Franklin.

What is public wealth ?

By whatever name we may express the units and constituents of wealth, it is in the aggregate almost wholly the product of labor. Labor to be effective, must depend on good health, and so indirectly, *health is wealth*, or its chief factor.

INVALIDISM IS A PUBLIC AS WELL AS PRIVATE CALAMITY.

Every individual disabled wholly or in part, by sickness, is to that extent and degree of disablement, not only a burden and loss to self and family, but also a burden and loss in various ways to the community and the State.

Invalids not only lose their own time for productive labor, but compel to a greater or less extent, the loss of time of others in their care, and also sustain pecuniary losses, to recover which, entails still further personal loss of time, and therefore loss to public productiveness.

Setting aside for the present all moral and humanitarian aspects of the question, suppose it to be examined solely on the business and pecuniary side, in the light of dollars and cents.

Assuming there are only 250,000 persons residing in the State, would it be unreasonable to assert that on an average there are 12,500 persons of all ages sick, or one in every twenty of the whole, i. e. five per cent., and that the requisite attention to the sick would require the time of somewhat above half as many more, say 7,500, or three per cent., making 20,000 in all, or eight per cent. Now if the labor of the whole population will average seventy-five cents per day, the scale running from nought to \$20 or more, here is a clear loss of \$15,000 a day to private and public wealth, during the continuance of the sickness, to say nothing of the loss thereafter; \$15,000 a day for 300 days makes the large sum of \$4,500,000.

That this estimate is not too high, may be inferred from the report of the Superintendent of the Census of 1875. On page 151 it is stated that the average wages in the whole State, for the woolen manufacture, was for all ages \$1.17 $\frac{1}{2}$. In this as well as in cotton and other employments, are children of ten years of age. On page 152 it is stated that in the cotton manufacture the average wages per diem are higher. These employments are referred to because they are supposed to afford the minimum wages of all occupations. In the professional, commercial and mechanical employments the average wages are considerably in excess of the manufactures alluded to.

It is believed that a very considerable part of the sickness that afflicts humanity is preventable. This belief is founded on what seems to be positive evidence, afforded by results of measures taken in some localities for the prevention and restriction of various diseases. Health boards have been in operation in many parts of England for more than thirty years, and the results of their labors have been so satisfactory as to lead the general government to establish them in almost every

borough of the kingdom. The reports *show conclusively that the sickness and mortality of those localities have been very materially reduced.* Suppose in Rhode Island by means of proper measures, the sickness could be diminished five per cent., which certainly is a low estimate, we should, on the calculation above, have a daily saving of \$750, or a yearly saving of \$236,000. This seems like a large saving for a small expenditure of money, but the conclusion is justified by facts!

We have another item of loss in the death of individuals. It may be assumed that the average individual at twenty years of age is worth in prospective availability, the average cost of support during the period of dependence, including food, clothing, education, care when young and in sickness, expenses of sickness, and every item, directly and indirectly. Suppose the average sum be estimated at \$100 per annum, then the average individual would have, at twenty years of age, a personal value of \$2,000 at least, (as no interest on cost is added,) as an investment of the public, and capable of adding to the public wealth a fair dividend, say five per cent., or \$100 per annum.

Now according to life and annuity tables, such person would have an expectation of fifty-two years of life, and an average of forty-five years of effective and productive value. It will be seen that the amount at the end of forty-five years, would be a very considerable sum. But if the individual should be stricken down by death, at that age, then the whole would be lost, and so would a proportionate loss be sustained by the death of an individual at any time, during the period of development or effectiveness.

In regard to this estimate, it may be stated that on page 158 of the Report of the Census of 1875, the total products of the State, for the year ending June 1st, 1875, were \$133,025,291; equal to \$515.12 for each person, of all ages in the State; or an average of about \$1.72 per day for every man, woman and child, allowing fifteen days each for lost time per annum. Now, with the previous estimate of the average of 75 cents per diem for individuals of all ages, sick or well, from infancy up, the amount of wages for labor for 300 days would be \$58,101,750, leaving about \$75,000,000 profit. This would leave, also, nearly \$300 per annum for every person of all ages and conditions in the State, as an addition to the public wealth, instead of \$100, the previous estimate.

The mortuary tables of the registration report for 1876, show the decease of 4,116 individuals during that year. Of these, at least 3,500 were in the effective, or expectantly effective period of life. Suppose the average public value of these persons be estimated—not at \$2,000,

the average value at twenty years of age, but at one quarter that sum—\$500, the loss to the public would then amount to the large sum of \$1,750,000. Now if by State action, five per cent. of these lives could have been saved, and that cannot be called a high estimate, we shall find the number of lives which might have been saved to be 175, and the amount of prospective public wealth preserved, the sum of \$87,500. If to this sum we add the \$236,000, the moderate estimate of the annual amount saved by the prevention of sickness, we have then the very large sum of \$323,800, which it is believed might be annually saved the State, by such measures as could be put in effective operation by a judicious board of health. Of course, there are many minor items of loss, public and private, which are the inseparable concomitants of sickness and death, not now to be taken into account, the purpose of this paper not contemplating the aggregation of minor details. The foregoing simply presents a summary exhibit of the coarser financial features of the question, on the dollar side.

If we now take into consideration the moral aspect of the question, we are met at the threshold with a multitude of facts, more abhorrent and appalling, than can be presented from any other view. It would be impossible, within the proper limits of this paper, to portray, except in the most cursory manner, the immense amount of degradation, vice and crime, that directly or indirectly have their origin in sickness of the body. They seem to be mutually causative the one of the other, and mutually convertible. Sickness in some, benumbs the moral nature, clouds the judgment, induces nervous irritability that intensifies the animal propensities, and these lasting longer than the return of bodily strength, through perversion of moral sense, plunge the unhappy victims into dissipation and degradation. But for sickness, many slums of vice would be depopulated.

How sickness of body taxes the resources of the State can be readily traced through various down hill grades, to the alms houses, jails, and penitentiaries. The civil and political aspects of the question, are so intimately involved in the brief considerations above, that they need no separate discussion.

By these statements we find the State a great loser by reason of sickness and death. Suffering financially, suffering socially and morally. The foundations of public and private virtue sapped, its future prosperity and existence endangered. What then? Can anything be done to stay the moral and physical death? The laws of nature are beneficent, rightly observed, but violated, are a two-edged sword. Though absolute, they are not tyrannical, they recognize the sacredness of

human life, and the blessedness of human health. The great fear of human mortals should be less the servile fear of human authority and human opinion, and more the fear of Divine authority, as declared and administered through the laws of nature. But when natural laws are recklessly or ignorantly violated by masses of citizens, it is the *duty* as well as the right of the State to interpose, and while seeking diligently to enlighten its people, should also affix a just penalty for violation of its own laws, enacted for the better observance of the laws of nature. It does seem as if the time has come when the State *cannot justifiably* withhold its authority in the devising and maintaining of proper measures for the protection of life and health, by instituting such inquiries in regard to the influence of locations, occupations, habits, customs and indulgences, as humanity requires, and by such interference in the removal of causes of sickness and death as common justice demands.

ECONOMY OF EARLY SANITARY ACTION.

The towns of Rhode Island are, with very few exceptions, in process of steady growth in population. Within some of them are conditions limited to small areas which, if allowed to remain, will, at no very distant day, become sources of disease, entailing great pecuniary loss, private and public. In most of them, these sources of future danger can be removed or remedied at very small cost, during these earlier periods of their growth, and thus stamped out, much suffering and expense prevented. But, by reason of delay, may be so hidden by the so-called march of improvement, that their existence is lost sight of and forgotten, until the outburst of some terrible epidemic reveals the perilous and portentous fact. And also, by reason of delay, some of these fountains of death may become so incorporated with large pecuniary investments, and thereby acquire the title of "vested rights" of individuals, that, though the right of eminent domain should be unlimited in the interests of public health, there would still remain the probability of costly litigation, and heavy damages. The attention of the general public, under direction of recognized authority, would readily detect many of these future sources of disease, and so be easily and cheaply preempted in the interests of humanity and public health.

For the purposes suggested above, of the prevention of disease and the protection of life, and thereby the enhancing of the interests of individuals and the State, it cannot be reasonably denied that

A STATE BOARD OF HEALTH IS NEEDED.

Because there is no other agency to effect the desired objects, or put in operation the desired measures. It is true that all intelligent and well educated physicians are regarded as the established conservators of the public health, and it is their duty to observe and study diseases in all their relations, to collect facts in regard to circumstances surrounding, as well as conditions personal to, and inhering in, the suffering individual, but they cannot, without going outside the daily routine of professional work, and at pecuniary loss, enter upon the wider labor of a comprehensive survey of the entire broad field of morbid phenomena, as affecting a large area of communities. This work, it is *the policy as well as the duty* of the State to put in operation. The question may be asked, how can a board of health accomplish the desired objects?

BY POPULARIZING A KNOWLEDGE OF THE MEANS OF AVOIDING DISEASES.

The dissemination among the masses of the people, of information in regard to the prevention of disease, emanating from acknowledged authority, would without question be respected, and its suggestions be largely observed. Such information, widely diffused, need not necessarily be attended with much expense. Tracts of one, two, or more pages of printed matter, at insignificant cost, can be scattered among the families of the State where they would be of value. Such distribution might be easily accomplished through town superintendents of public schools, and many other agencies. Then again, doubtless, the public press, at intervals, would admit short articles of a half column or so, without any expense to the State, on the policy of furnishing to its readers matter of public interest and value. In this way great numbers of the people, otherwise ignorant, thoughtless or indifferent, would have their attention effectively called to sources of danger and the means of defence. Notwithstanding the fact, that so many

“ Know the right and approve it too,
But know the wrong, and yet the wrong pursue.”

and the known perversity and carelessness, characteristic of human kind, it must be admitted that popular hygienic information and instruction, so diffused, must inevitably largely influence the public mind and perceptibly decrease the percentage of sickness and the death rate. Among the common causes of preventable disease, about which the masses of the people need more positive knowledge, may

be mentioned vitiated air, absence of light, morbid emanations from cess-pools, sink drains, decomposing garbage; haze and dusts holding animal, vegetable or inorganic irritants and poisons, special morbid products derived from diseased bodies of men or animals, exhaustion of physical and mental vitality, by too prolonged or excessive labor of body or mind, loss of sleep; violent anger, grief or joy, and long immersion in cold and humid atmospheres. It will be seen that a State board is needed

TO GIVE UNITY OF PURPOSE AND EFFECTIVENESS

to diffusion of sanitary knowledge, and to direct investigation in a systematic manner:

1. The first, and the continued leading object of a State board of health should be (*a*) the general enlightenment of the people in sanitary knowledge, (*b*) so that they may have a clear understanding of the rights, duties and responsibilities of all persons in relation to public as well as to personal health; and (*c*) to perceive the necessity of the earnest observance and enforcement of good sanitary laws and regulations, as the foundation of success, in the promotion of health and longevity.

2. To act as a central board in giving enlightened direction to all labors of a sanitary character, that may be instituted in different sections of the State; first, by suggesting systematic and uniform methods of inquiry and investigation; second, by suggesting the best modes of applying general sanitary laws to special or local circumstances; and third, by suggesting to local authorities the presumably best means of securing popular support to local sanitary administration; and fourth, by encouragement and promotion of formation of village health clubs, who will look after the performance of the sanitary duties of their respective localities, under the superintendence of the central board.

3. In reference to the above remarks, it need hardly be observed that the inference is clear that every person, family, community, town and city, have each certain individual and local, as well as general, duties and responsibilities in regard to the prevention of disease and loss of life, and while more widely spread and general causes of peril to life and health exist, requiring a central sanitary organization, such central organization can most fully accomplish its purpose by giving unity of purpose, counsel and aid to local organizations.

4. Such local organizations, by observation and inquiry, can collect a mass of facts, not otherwise so well attainable. These facts singly, may seem and be of little value; but, reported from many points, over a considerable extent of territory, and under a great variety of circumstances, will, when properly arranged and classified, and subjected to a reasonably inductive method of study, become a valuable basis for generalizations and logical conclusions, and also valuable as affording great aid in the observation and detection of new facts. Sanitary observations must necessarily extend over a considerable territorial area, comprising cities, towns and villages, neither of which alone can furnish all the facts absolutely needed for full generalization. What is true of a city, may not be true of a country town or village, any more in sanitary matters than in morals, habits or customs. Consequently, the jurisdiction of the central board, should comprise supervision, not only of important, but also such as at first thought, might be regarded as unimportant localities.

There has been in contemplation, for a number of years, the establishment at the national capital of a national health bureau, or a public health commission for the United States. Such a bureau like the signal service office, must be in regular correspondence with responsible bodies in all the several States; bodies having defined duties and authorities, such as are conferred on State boards of health. At this time there are three departments of the national government doing all their limited authority will allow, in the way of collecting an accurate knowledge of, and in the restriction and prevention of diseases, mostly of an epidemic character. They are the surgeon general's bureau of the army, the medical department of the navy, and the marine hospital service. Compared with what might be accomplished by a bureau established for the specific purpose of promoting the national health, their work is very limited. When all the States, or nearly all, (and the time is near at hand, nearly one-half already) have established boards of health, then the knowledge acquired in the several States can be utilized by a national board, to the great advantage of the nation. Without question, in a majority of cases, the inception and development of pestilences can be detected at the outset, the course of the epidemics, and the spread of the contagion arrested, and their existence stamped out.

A bill is now pending in the Senate of the United States, having passed the House of Representatives with such unanimity as to give good assurance of its becoming a national statute, to aid State and municipal authorities in excluding from the country contagious and

infectious diseases. It requires weekly reports from Consuls of the sanitary condition of foreign ports, and oftener by telegraph if at hand, if needful to announce the departure of suspected vessels or persons, and requires all needful information to be distributed to the local State and municipal authorities, by the Surgeon-General of the Marine Hospital Service. It alludes to State organization of boards of health in such a way as to lead to the inevitable inference that the general government expects that state boards of health will be soon universally established throughout the country.

The limited time allotted me forbids a more extended consideration of the subject at the present time; but such suggestions as have been made are simply skirmishing on legitimate ground, for the more the field of sanitary observation, presenting prospective benefits from systematic legal supervision, is surveyed, the wider its borders extend. There is to-day in all the broad world no material agency of any kind whatsoever, that is working out so many, promisingly beneficent results to mankind, as that which is involved in the universal application of the laws of sanitary science. They are demonstrating that health and longevity are the natural inheritance of mankind; that disease is abnormal, and death accidental, except from natural decline of age; and that both are largely preventable by human agencies.

CHARLES H. FISHER,

For the Committee on Executive Communications.

The above report of the Joint Committee on Executive Communications, was presented in the Senate simultaneously with the introduction in the House, by the Committee on State Charities and Corrections of the new bill for the establishment of a State Board of Health. This bill after reference to another committee of the House, and after various delays, verbal alterations and amendments in both houses, was finally passed and became a law as follows :

AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

It is enacted by the General Assembly as follows:

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members

of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the Board.

SEC. 2. The six persons first appointed, shall be appointed for one, two, three, four, five and six years respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the Board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy, shall be for the remainder of the term.

SEC. 3. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of Chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of Chapter 76, of the General Statutes, where the word "commissioners" occurs, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law, but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of Chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of section 2, of said chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of Chapter 77, of the General Statutes, is hereby repealed.

SEC. 9. The Board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the Board, except the Secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the Board, shall be paid by the State.

SEC. 10. The Board shall elect a well qualified physician as their Secretary.

SEC. 11. The Secretary shall perform and superintend the work prescribed in this law and such other duties as the Board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the Board may determine. He shall hold his office at the pleasure of the Board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 12. The Governor shall provide a suitable office for the Board, in the city of Providence, and the actual expenses of the Board and of the members thereof, when certified by the Chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 13. The Board shall make a report in print, to the General Assembly, annually in the month of January, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 14. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 15. The several town councils and boards of aldermen shall still be *ex-officio* boards of health in their respective towns, as is now by law provided; *provided, however*, that the city council of any city may appoint a board of health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a board of health.

In accordance with the provision of the law, requiring the "Governor with the advice and consent of the Senate," to appoint the six persons who together should constitute the Board, His Excellency at a proper time presented to the Senate, the following persons in the order named, with the county represented, and the terms of service respectively, viz :

DAVID KING, M. D., Newport County.....	six years.
ELISHA DYER, Jr., Washington County.....	five "
CHAS. H. FISHER, M. D., Providence County.....	four "
GEORGE W. JENCKES, M. D., " "	three "
WM. T. C. WARDWELL, Bristol "	two "
ALBERT G. SPRAGUE, M. D., Kent "	one "

The appointees were unanimously confirmed by the Senate:

ORGANIZATION OF THE BOARD.

Ten days after the rising of the General Assembly, to wit: the 22d day of April, the members elect were called together at the State House in the city of Providence, by David King, M. D., of Newport, in obedience to the order of the Governor. Upon the assembling of the members, the oath of office was administered by the Secretary of State, and after calling the meeting to order, Dr. King made the following remarks:

Gentlemen of the State Board of Health:

By order of the Governor of the State, it has become my duty as your senior member, to call together the members of the Board. The objects of our investigation are of the highest importance to the welfare of the State. Within the department of public health, improvements and reforms, inaugurated by us, will be beneficial in their tendency, and permanent in their influence. We cannot but engage in the respectable, I may say, high duties, assigned us by the government of the State, with the pleasing and assured prospect of accomplishing much good in our midst.

It will be our duty to take cognizance of the interests of life and health among the citizens of the State, to make investigations into the causes of disease, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and to faithfully do all in our power to ascertain the causes, and the best means for the prevention of diseases of all kinds in the State. And not of men alone, but to investigate also, the subject of diseases among cattle and other animals.

The field of our duties and labors is therefore wide, embracing every circumstance and agency that can affect animal life, or man, regarded as a physical being, or as a physical being endowed with an intellectual and moral nature.

A distinguished writer of acknowledged authority has declared, "that public or State medicine has for its primary object the prevention of disease; the surrounding the sick with conditions most favorable to recovery; and the diminution in a marked manner of the death roll of the people; that the ultimate object of State medicine is the improvement of the races of men to their highest possible degree of perfection." This may be regarded as a fair and comprehensive statement of the aims and purposes of the State Board of Health.

In the consideration and investigation of subjects having a practical bearing on public health, I trust that we shall deliberate and act with a due sense of the responsibility placed upon us by the Governor and General Assembly, and with the spirit and energy of men entrusted with these most important interests of the State.

Among the subjects especially demanding our attention, may be mentioned:

1. Epidemic, Endemic, and Contagious Diseases.
2. Sewerage and Drainage.
3. Food, Drinks, and Water-Supply.
4. Buildings—Public and Private; including Ventilation, Heating, etc.
5. Climate—General and by Season of Year; and as related to Age of Inhabitants.
6. Disposal of Excreta and Decomposing Organic Matter.
7. Poisons, Explosives, Chemicals, Accidents, and Special Sources of Danger to Life and Health.
8. Occupations and Recreations.
9. Education: the Relation of Schools to Health, the kind and methods of instruction in use, and methods to be proposed.
10. Geology and Topography: Influence on health, of Forests and their removal, Shade Trees near Dwellings, etc.
11. The Death-Rate as influenced by Age, Climate, and Social Condition.
12. Legislation in the Interests of Public Health.
13. Finance.
14. Mental Hygiene.

A temporary organization was then formed, and upon the calling of the roll, the following members were found present, viz:

DAVID KING, M. D.....	Newport.
HON. ELISHA DYER, Jr.....	Wickford.
GEORGE W. JENCKES, M. D.....	Woonsocket.
CHARLES H. FISHER, M. D.	Scituate,
ALBERT G. SPRAGUE, M. D.....	Warwick.

Upon motion, Dr. David King was unanimously elected permanent Chairman, and Charles H. Fisher, permanent Secretary.

WORK OF THE BOARD.

Under this head, it is not designed to report all the transactions, that are put on the record of the various meetings of the Board, but such only as will give a general outline of the plans and purposes governing its action, in laying out work for itself and the Secretary.

At the meeting for organization, and following the election of officers, considerable informal discussion of various topics relating to the public health ensued. The subject of the prevalence of glanders and farcy among horses, was considered at greater length than any other, and the necessity of immediate action for its restriction was apparent. A set of regulations having particular reference to glanders and farcy in horses was adopted, and the Secretary was authorized to publish the same in the newspapers of such counties or districts, as were found by inquiry to have horses affected with the said disease. The advertisement was as follows:

RHODE ISLAND STATE BOARD OF HEALTH.

GLANDERS IN HORSES.

At a meeting of the State Board of Health held Monday, April 22, 1878, the following regulations were adopted and ordered to be published:

1. The owners of, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall keep such horse or other animal apart and separate from all other horses or animals.
2. The owner, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall not lead, nor drive, nor permit such horse or other animal to go in or over any public street, road, lane or highway in this State.
3. Any veterinary surgeon or other person who shall have knowledge of any horse or other animal that has the disease called glanders or farcy, shall report

the existence and location of such case of disease to some member of the State Board of Health within twenty-four hours after receiving knowledge of the same.

The penalty for failure to comply with the above regulations, as fixed by Section 8, Chapter 76, of the General Statutes, is a fine not exceeding three hundred dollars, or imprisonment not exceeding one year.

The first section of the same chapter provides that any person who shall knowingly expose a horse or other animal having any infectious or contagious disease to other horses or animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

Section 7 provides that any person who shall sell *or offer to sell any horse or other domestic animal* known to him to be infected with any contagious disease, shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

All persons are urgently requested to give immediate information to some members of the State Board of Health of any known or suspected case of glanders or farcy that may come to their knowledge, and such cases will be immediately investigated and measures taken to prevent the spread of the disease.

The names and post office address of the members of the State Board of Health are as follows: David King, Newport; Elisha Dyer, Jr., Wickford or Providence; Charles H. Fisher, North Scituate; George W. Jenckes, Woonsocket; William T. C. Wardwell, Bristol; Albert G. Sprague, Centreville.

By order of the State Board of Health.

DAVID KING, Chairman.

CHARLES H. FISHER, Secretary.

PROVIDENCE, April 24, 1878.

These regulations had been previously adopted and published by the preceding Cattle Commission. The Secretary was also authorized to employ, the same means and agencies heretofore employed by the Board of Cattle Commissioners, for the purpose of ascertaining the existence, and for the restriction and suppression of glanders and farcy, or any other highly contagious and dangerous diseases, among horses or other domestic animals. (*See Cattle Commission page 11.*)

At the same meeting a committee was appointed to draft a code of By-Laws for the government of the Board. Dr. George W. Jenckes, chairman of that committee, reported at the next subsequent meeting, a code recommended by the committee. The several sections of the reported code were taken up in order, considered, and severally adopted. They are as follows:

BY-LAWS.

SECTION 1. This body shall be known as the Rhode Island State Board of Health.

SEC. 2. The officers of the Board shall consist of a Chairman, Secretary and Auditor, to be chosen annually at the meeting in July.

SEC. 3. The duties of the chairman shall be to preside at the meetings of the Board, to put all votes, to decide questions of order, and to appoint all committees when not otherwise voted by the Board. He shall certify all audited bills to the Governor for payment.

SEC. 4. The Secretary shall perform all duties prescribed in the act establishing this Board, shall keep a record of the proceedings, shall do all acts usually incident to the office, and shall notify the members of all regular meetings, and by the advice of the Chairman, shall call all special meetings.

The Secretary shall have an office in the city of Providence, which he shall keep open between the hours of one and three o'clock p. m., upon all business days.

SEC. 5. The auditor shall examine all bills and vouchers, and if correct shall certify the same to the Chairman of the Board.

SEC. 6. A majority of members shall constitute a quorum to transact business but any member may adjourn.

SEC. 7. The regular meetings of this Board shall be holden at its office in the city of Providence, on the first Wednesday of July, October, January and April, respectively, at such hour as the Board may by vote determine from time to time.

VITAL STATISTICS.

No department of the work of the State Board of Health is of more importance than that which relates to the collection and registration of births, marriages and deaths. Twenty-five years ago, many collectors of returns of births and deaths, were met with censure, and even with resistance, from some persons who occupied respectable positions in society. The law, and the work of carrying out its provisions, were denounced as a scheme concocted mainly for partisan and political purposes. All feeling of that kind has now no existence except among the lowest and most ignorant class of our population. The value of such registration in relation to the legal rights of individuals, is now too clear to be disputed, but there are many minds still clouded, in regard to the value of the registration of births, and of full returns of the attendant conditions and circumstances of

death, as a basis of sanitary and social and political economy. These clouds, however, must at no distant day disappear, when their importance, properly classified, arranged and compared, for sanitary study is better known; as have those which a few years since obscured some ordinary minds in regard to the value of registration, in relation to descent and inheritance.

The opposition to the collection of statistics alluded to above, does not apply solely to this State. The measures taken to obtain such facts as were called for in the United States Census of 1790 were violently opposed by the people in some of the States as an invasion of private rights.

It required several years to satisfy large masses of citizens, that the movement would promote a large public interest, that the country would not know itself, but for the facts elicited and spread before the people by each decennial Census.

The enumeration of the peoples, of the products, and of the properties of all kinds, shows us what we are, what we have in possession, how we progress. By this enumeration the government learns its military and financial strength. By it is ascertained what will best promote the prosperity of sections, and what, that of the country at large.

The enumeration of births, marriages and deaths in the United States Census, has been found quite as important as that of any other class of statistics. It indicates the bodily vigor, the moral tone, the relative longevity, and consequently the status of the public health, in the various divisions of the country, its augmentation or its decline. Upon public health depends the strength and stability of the government, and therefore by these statistics it may learn its probable prosperity or adversity.

RETURNS OF BIRTHS.

The Statutes provide that the town clerk of any town, or some person appointed by the town council, or board of aldermen of a city, shall obtain all information concerning births, occurring during the previous year among the inhabitants of their respective towns, and on or before the first Monday in March annually, to make certified returns thereof to the State Board of Health. This mode is doubtless as effectual for accurate returns, as any that can at present be devised. It is especially useful in obtaining the full names of children born, early in the preceding year, which could not be done soon after birth. It is, however, defective in that it fails to enumerate

in many towns, all the births that have occurred in those towns. The frequent removals of families from one town to another; the occupation of the same tenement by several families during the year; therefore, births occurring in these migratory families are not returned, because few or no facts can be ascertained in regard to them in the towns where they occurred, and they cannot be registered in the towns where they are found, during the months of January and February of the ensuing year. Some births also fail to be returned because of the death of the child in early infancy, and forgetfulness or indifference on the part of parents and neighbors.

Different methods of collecting birth statistics have been adopted, since the first registration law was enacted. It was at one time obligatory on the part of the parents to make return to the town clerk within ten days after the occurrence of the birth of any child.

Physicians were also required by law to make returns of births occurring in their practice, and a small fee to be paid out of the town treasury was allowed therefor. But the present mode has been far more efficient than any other heretofore tried. It might be suggested that amendments to the present law be made, requiring the collector of birth returns, when he ascertains that a birth had occurred in another town, in any family living in the town which he is canvassing, he shall make a separate return of such birth, which he shall transmit to the town clerk of the town in which such birth occurred, and receive therefor, from the town to which such return was made, a fee double the usual amount.

The form of Returns of Births have varied somewhat since the passage of the Registration Act of 1854. The form now in use is as follows :

RETURN OF A BIRTH.

STATE OF RHODE ISLAND.

1.	Date of Birth ?.....	.....
2.	Full name of the Child?.....	.....
3.	Sex?.....	.....
4.	Color?.....	.....
5.	No. of Child of Mother?.....	.....
6.	Place of Birth?.....	.....
7.	Father's Name?.....	.....
8.	Father's Age?.....	.....
9.	Father's Occupation?.....	.....
10.	Father's Birthplace?.....	.....
11.	Mother's Name?.....	.....
12.	Mother's Maiden Name?.....	.....
13.	Mother's Age?.....	.....
14.	Mother's Birthplace?..	.....
15.	Color of Parents?.....	Fa..... Mo.....
16.	Remarks.....	.....

INFORMANT.

N. B.—At No. 2, give the full name of the child, and be *particular to get middle name in full*. At No. 4, state whether the child is white, black, or mulatto. At No. 5, state whether it is the 1st, 2d, 3d, etc. child of the mother. At No. 6, give the street and number, if in the city, the town and State, if elsewhere. At Nos. 8 and 13, give the age at last birthday. At Nos. 10 and 14 give the town and State, if in this country.

If the child was still-born, or has died since its birth, state the facts at No. 16, *with any other facts of interest*.

In case of twins or triplets, a separate blank is to be filled for each child.

RETURNS OF MARRIAGES.

The returns of marriages in the State of Rhode Island, are without question more full and accurate than those of births and deaths. The popular impression of their importance to the public at large, as well as to the individuals immediately interested, is much stronger, and the feeling of responsibility on the part of those who perform the ceremony, is clearer and more imperative. The returns of marriages for the whole State, for the year 1877, were 2,282, as against 2,253 for the year 1876, showing that the prevailing hard times, have not prevented a partial return toward the number registered in previous years. For the year 1873 there were returned for the whole State 2,630. The form of return now in use is as follows:

[FACE.]

RETURN OF A MARRIAGE.

STATE OF RHODE ISLAND.

1. Full name of GROOM?.....	.....
2. Place of Residence?.....	.....
3. Age in years?.....	.....
4. Occupation?.....	.....
5. Place of Birth?.....	.....
6. Father's Name?.....	.....
7. Mother's Maiden Name?.....	.....
Parents' Birthplace?..	Fa.....Mo.....
Parents' Occupation?..	Fa.....Mo.....
8. Full name of BRIDE?.....	.....
(Maiden name if a widow?).....	.....
9. Place of Residence?.....	.....
10. Age in years?.....	.....
11. Place of Birth?.....	.....
12. Father's Name?.....	.....
13. Mother's Maiden Name?.....	.....
Parents' Birthplace?..	Fa.....Mo.....
Parents' Occupation?..	Fa.....Mo.....
14. No. of Marriage?.....	Of Groom?.....Of Bride?.....
15. Color of the Parties?.....	.....

N. B.—At No. 15, state whether white, black or mulatto. At No. 14, state whether this marriage is the 1st, 2d, 3d, &c., marriage of each. Give middle names in full.

.....18

We, the Groom and Bride named in the above certificate, hereby certify that the information given is correct to the best of our knowledge and belief.

.....GROOM.

.....BRIDE.

Signed in presence of.....

and.....

N. B.—The above blanks must be filled, and the certificate must be signed by both Groom and Bride, and must be given to the person about to solemnize the marriage, *before* the marriage can be legally solemnized in the State of Rhode Island.

[REVERSE.]

CERTIFICATE OF MARRIAGE.

STATE OF RHODE ISLAND.

I HEREBY CERTIFY, That.....and
were joined in Marriage by me, in accordance
 with the laws of the State of Rhode Island, in the town of.....
 this.....day of.....A. D. 18

ATTEST.....

Witnesses to the Marriage.....

N. B.—The Clergyman or other person solemnizing the marriage is required to sign this certificate, and return it to the Clerk or Registrar of the town or city in which the marriage takes place, *on or before the second Monday of the month succeeding the date of the marriage.*

The laws of Rhode Island require at least two witnesses to be present at a marriage, in addition to the parties and the Clergyman officiating. Give the names of two who were present.

RETURNS OF DEATHS.

The mortuary records of the State, can be made to furnish a vast amount of valuable information, when the physicians' certificates, make definite replies to specific questions, touching the phases and characteristics of fatal diseases, and the conditions and circumstances under which the deaths occur. It is, however, too much to expect, that returns bordering on completeness in that respect can at any early day be available.

The general professional mind must first be imbued with a deeper feeling of regard for the best welfare of its patrons beyond the period of immediate sickness, and also of responsibility to the great public and the State. "To make investigations into the causes of disease, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health," as the law directs, must of necessity demand more extended interrogatories in the physicians' certificate, than have heretofore, or are now made in the returns of death. The town Registration Record of deaths, need not be changed for such additional questions, but the summarized Reports to be transmitted to the State Board of Health, must have spaces and columns to correspond with all the questions on the returns. Such blank Reports will be forwarded to all the town clerks in time for tabulation of the returns for the year 1879. Recognizing the great importance of *accurate* and *complete* returns of deaths for purposes of sanitary study, and desiring to ascertain how fully the provisions of the law were complied with, in regard to death returns, I sent the following circular (letter B) to the town clerks of all the towns in the State:

(CIRCULAR B.)

FROM THE OFFICE OF THE R. I. STATE BOARD OF HEALTH.

To the Town Clerk of

1. How many undertakers in your city, or town?
2. How many make returns as provided in Sec. 8, Chap. 77, of the General Statutes, and as amended by Sec. 3, Chap. 488, of the Public Laws?
3. What proportion have physicians' certificates appended?
4. Have delinquents ever been notified, that complaint would be made for neglect of duty, as provided in Sec. 11, Chap. 77, of the General Statutes?
5. If deaths are not reported by undertakers, how are they ascertained for the Annual Returns?

6. Has your town a Board of Health acting separately from the Town Council?
7. How many Health Officers are appointed by the Town Council or otherwise?

N. B.—Please reply by the numbers on the Postal Card, corresponding to the number of the questions.

C. H. FISHER, Secretary.

STATEMENTS OF TOWN CLERKS IN REPLY TO CIRCULAR B.

In answer to question Number 2, the clerks of thirty towns in the State, replied that few or no returns were made by undertakers, as provided by law, but in reply to question Number 5, that the returns of deaths were collected by the town clerk or some other authorized person during the months of January and February, in the year succeeding that in which the deaths occurred. It is easy to see how imperfect the collection of returns of the deaths in those towns for the whole preceding year must be.

In some cases the decedents are merely visitors or sojourners in the town, and if the facts of the case are not ascertained at the time of death, they can never be afterward. Again, many families in which deaths have occurred, have removed before the end of the year into another town, or out of the State, and therefore no account, or no correct account of such decedents can be obtained. In all of these cases the record of death is lost, for if the family in which a death has occurred in one town, is called upon by the collector of death returns in another town where they then reside, and statement is made to him of such death, it is of no account to him, as he is not required or expected to obtain returns of deaths that have occurred in another town.

In reply to question Number 3, twelve towns were reported, where no physicians' certificates whatever were appended to returns of deaths. In other towns the proportion having physicians' certificates attached, were given as one-eighth, one-quarter, &c., up to all where a physician was in attendance.

In relation to notifying delinquents, thirty-one towns answered in the negative to question Number 4, and twenty-eight towns replied no and none to questions 6 and 7.

It is needless to comment on the unreliable character of death returns for sanitary study, in which the causes of death are given by persons having very little knowledge of disease, and many times, a year after the occurrence of death.

By statute law, it is made the duty of the physician in attendance, to report every case of death at the time of its occurrence.

This is the only right time, because then, the character of the disease and all the attendant circumstances are fresh in his mind. Efforts will be made during the ensuing year to bring about a more prompt compliance with the Statutes, in relation to physicians' certificates of deaths, as well as to undertakers' returns. In furtherance of that object, the following circular (letter C,) was sent to all the town councils and town clerks in the State:

(CIRCULAR C.)

FROM THE OFFICE OF THE STATE BOARD OF HEALTH.

PROVIDENCE, December 2, 1878.

*To the Honorable the Town Council and the Town Clerk of the
Town of*

GENTLEMEN:—You are already aware that by the Act of the General Assembly establishing a State Board of Health, the manner of making the Annual Returns of Births, Marriages and Deaths, has been changed. The returns will now be made to the Secretary of the State Board of Health, and all blanks for that purpose can be obtained from him. It is expected every town clerk will comply with the law, as provided in Section 1, Chap. 77 of the Revised Statutes, especially when duly certified returns are made "*accompanying the same, with a list of those individuals, required by law to make returns to him, who have neglected the same.*"

It is hardly necessary in this connection, to call your attention to the great value of correct registration, of the births, marriages and deaths in your town. In their civil relations, affording definite evidence as to legal consanguinity, and rights of inheritance or entailments, rights and claims for pensions, insurance, or hereditary annuities. In their social relations, as a record and evidence of the public spirit, the moral tone and the disposition for associated interest, manifested at different periods of time. In their sanitary relations, though usually less apprehended they are no less important. Indeed, without them sanitary improvement would be greatly impeded. Without a record of births and deaths, the bodily vigor, the relative longevity, the average healthfulness, the tendency to particular diseases in any community, could scarcely be determined.

By such record, a clue to the laws of life and health is furnished. Such statistics afford the sanitarian, standing ground for observing the effects of localities, conditions, employments and circumstances of life, as causations of disease and sources of mortality. But, for *exact conclusions* there *must be correct returns*. False premises lead to defective and deceptive deductions. Incorrect returns lead astray. An investigation of the methods by which the registration returns

of this State have been obtained, and an examination and comparison of the returns so obtained, show that in some towns they are very inaccurate. The number of births returned from a town, have been less than the number attended by one practitioner of medicine in the town. Great negligence has also been practiced by undertakers and physicians, in regard to the returns of deaths. Attention is called to Sec. 12 of Chap. 77 of the Statutes, with the hope that every town council will require a record of the names of all the classes therein named, and give due notice to the same, that their duties as set forth in Sec. 4, Sec. 6 and Sec. 8 of Chap. 77, must be promptly performed.

The supply of blank returns of deaths, in the office of the Secretary of State have been exhausted. I have therefore ordered a sufficient number printed for present use, which will soon be ready at this office, for meeting the orders of Town Clerks and others therefor. In ordering the new blank death returns I have taken occasion to add, on the back of the same, additional sections of the law, in relation to making returns, and also a notice, that the Secretary of the State Board of Health, had been instructed to make complaint of violations of the law. I have also for greater accuracy and definiteness, particularly in the physicians' certificate, added more interrogatories. There is an important end to be gained by full replies to the questions, and it is very desirable that all engaged in filling out the returns, should feel a deep interest in making them as valuable as possible.

The necessity of vaccination, should also receive the attention of the Town Councils, as a means of stamping out one of the greatest scourges of the human race. The way of performing the operation in the school houses of the country towns, as it is usually practiced, hardly meets all the requirements of the case. In some instances not more than two or three are ready for the operation, while there may be five times that number in the district wholly unprotected by adequate vaccination, and the same proportion holding for larger numbers. It is important that some more effectual way should be devised. Town ordinances could be enacted to meet the difficulty.

Let no child go into the public schools, who cannot show proof of thorough vaccination, by physician's certificate, or otherwise. When the agent of the town canvasses for the School Census, as provided in Chap. 693 of Public Laws, or for returns of births, a very slight additional labor, would determine how many persons in the town were unvaccinated, and such knowledge would aid in devising means for the more effectual performance of the work. The *spirit* as well as the *letter* of the last four sections of Chap. 74 of the Statutes, should be thoroughly carried out. The present facilities for obtaining bovine virus fresh from the udders of the cow, obviates all objection heretofore urged against vaccination, as a possible means of the transmission of morbid humors, from one person to another.

It is suggested as a matter of importance, that in those towns where it is not already accomplished, one or more competent physicians should be appointed to act as the local or town board of health, subject to the authority, and in place of the town council.

Professional men whose training, and whose experience, have especially fitted them to be competent judges of what is prejudicial to the public health, can surely be more safely relied on for judicious application of the sanitary laws of the State, than those having no such knowledge.

All matters coming within the jurisdiction of the first six chapters of Title XIV, of the Revised Statutes, and all additions and amendments thereto, should therefore have professional administration.

It is hoped, and believed, as well as earnestly desired, that the local boards of health of the several towns, however constituted, will cordially coöperate with the State Board of Health, in the work of investigating the causes of disease, whether general or local, and thus secure within a reasonable period of time the prevention of a considerable amount of dangerous sickness, in the various communities, and a perceptible decrease, in the tables of mortality.

Very respectfully,

CHAS. H. FISHER, Secretary.

Since the above circular was sent to the town councils of the different towns, it has been noticed in the reports of the proceedings of several of those bodies, that they have ordered notice to be given to all parties concerned, that they must comply with the statutes, in relation to the returns of marriages and deaths.

Such measures should be taken by every town council in the State, for it is incumbent upon them to make the duties set forth in the laws of vital registration, obligatory on the part of those of its citizens who assume positions described therein.

The interrogatories added to the last issue of blank returns of deaths will find no column for them in the record of death returns, which is retained by the town for its own use, nor would the record of those sanitary questions be of value to the town were these blank records furnished for the purpose. They are of great interest and value, however, to investigators of the causes of disease, and the State Board of Health hope to have the returns properly filled, and as neither the town record, nor the record heretofore transmitted to the Secretary of State, have blank columns corresponding to all the questions, the Secretary of the Board, as heretofore suggested, will furnish blank records of smaller size for those additional questions, to the town clerks of all the towns, previous to the time when they will be needed.

It may be observed that the questions in the blank returns of deaths used for two or three years past, have not all had blank spaces for their separate entry on the town and State general records, and have therefore been of no increased value for sanitary study.

The form of returns of deaths just issued, will be found on the following pages:

[FACE.]

RETURN OF A DEATH.

STATE OF RHODE ISLAND.

- | | | |
|-----|------------------------------|--------------------------------|
| 1. | Date of Death..... |187 |
| 2. | Name in FULL?..... | ..... |
| 3. | Age?..... |Years.....Months.....Days |
| 4. | Place of Death?..... | ..... |
| 5. | Street and No?..... | ..... |
| 6. | Sex?..... | ..... |
| 7. | Color? ..... | ..... |
| 8. | Condition?..... | ..... |
| 9. | Occupation?..... | ..... |
| 10. | Place of Birth?..... | ..... |
| 11. | Father's Name?..... | ..... |
| 12. | Mother's Name? ..... | ..... |
| 13. | Parent's Birthplace? Fa..... |Mo..... |
| 14. | Where Buried ..... | ..... |

.....INFORMANT.

N. B.—At No. 4, give city or town and village. At No. 5, if no street, state what part of school district. At No. 8, state whether married or single, widow or widower. At No. 13, state the *country* in which each parent was born.

PHYSICIAN'S CERTIFICATE.

- | | | |
|----|----------------------------------------------------------|----------|
| 1. | Name?..... | ..... |
| 2. | Date of Death? |187 |
| 3. | Disease? Primary..... | ..... |
| 4. | “ Secondary..... | ..... |
| 5. | Immediate Cause of Death?..... | ..... |
| 6. | Sanitary Surroundings: Good?.....Bad?.....Average? ..... | ..... |
| 7. | Duration of Disease? Primary.....Secondary..... | ..... |

.....PHYSICIAN.

N. B.—At No. 5, state whether from exhaustion, paralysis, suffocation or what. At No. 6, state yes or no to the questions. For out doors make sign, + over reply. For out and in both make sign, =.

I certify that the above is a true return, to the best of my belief.

.....UNDERTAKER.

[REVERSE.]

EXTRACT FROM CHAPTER 77 OF THE GENERAL STATUTES OF 1872, "OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES," AS AMENDED BY CHAPTER 488, PASSED MAY SESSION, 1875.

SECTION 2. Section 6 of said Chapter 77 is hereby amended so as to read as follows: "Whenever any person shall die, or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating, in case of a death, the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

SEC. 3. Section 8 of said chapter is amended so as to read as follows: "The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 3, as hereby amended, on or before the second Monday of the next succeeding month to the clerk of the town where such death or bringing forth took place."

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall willfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the cause, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained, that no clergyman, physician, undertaker, coroner, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded, in the clerk's office of the town where he resides.

N. B.—For the purpose of securing more correct registration of deaths, the Secretary of the State Board of Health is instructed to make complaint of any violation of the law in relation thereto. Incomplete returns will be returned for correction, unless the reason therefor is given on the return.

How best to secure complete returns of all the deaths in the State, and obtain accurate accounts of the causes of death, and the circumstances surrounding all cases of preventable diseases, is the great question for solution.

It seems, however, very evident that at least one additional provision can be made to our vital registration laws, which will go very far toward remedying the evil of neglect in the return of deaths, and especially of cases not attended by a responsible physician or buried by an undertaker.

And that is the requirement of a burial permit before interment, in every case of death, or a removal permit if such is desired, in all the towns in the State, the same that is required in the cities and some of the more thickly settled towns.

These permits might be granted by town clerks, and all members of town councils, all health officers of a town, and if in the judgment of the town council, thought advisable for convenience, the trustees of school districts, all of whom should be required to make report of the same.

PLANS OF WORK.

It is the design of the Secretary of the Board to endeavor to obtain from physicians and clerks of local boards of health in all the towns in the State, a MONTHLY STATEMENT of the diseases most prevalent in their respective localities, during the month, together with the general degree of severity, and the comparative mortality; the rainfall; the condition of the soil in regard to moisture or aridity, during the month, and different weeks in the month; the average temperature of the atmosphere, whether the weather has been subject to sudden changes, and the degree of change, the condition of vegetation (if in the warm season) as to luxuriance or feebleness; the fruit, potato, cereal and grass crops in particular, as to mildew, mould, rust, smut or blight; the prevalence of any unusual kind of sickness, with its characteristics and rate of mortality; the relative amount of general or particular sickness, with proportionate death rate, compared with the average of the corresponding month of previous years; the noted absence of ordinarily prevalent diseases of the month, together with statements of facts regarding the prevalence of contagious diseases occasioned by communicability, and suggestions as to the causes of general or particular diseases, and especially those causes of disease

which are believed to be removable. Such statements of facts as are suggested above, from a single small area of observation would, as elsewhere remarked, be of little value, but reported from many locations, and comprising all the towns in the State, will, when properly classified and arranged, become a valuable basis for sanitary study and generalization, and afford great aid in the suggestion of other and better methods, for the observation and detection of new facts.

Sanitary observations must necessarily extend over a considerable territorial area, comprising cities, towns, and villages, neither of which alone can furnish all the facts absolutely needed for full generalization.

In order to secure the coöperation of intelligent observers in different sections of the State, and especially such as by professional culture and experience, are better fitted for sanitary observation, the following circular (letter A) was sent to a considerable number of the medical profession, of prominence in their respective localities, and embracing all the towns of the State:

(CIRCULAR A.)

OFFICE OF THE STATE BOARD OF HEALTH,

17 COLLEGE STREET, PROVIDENCE, R. I.

DEAR SIR:—The Rhode Island State Board of Health, desires reliable correspondents among practitioners of medicine, in all the sections and localities of the State. The work required of correspondents, will be replies to such circulars of inquiry, as may be sent to them, and statements of facts concerning the presence, and presumable causes of disease, which have come to their knowledge. It is especially desired, that the prevalence in any locality of severe forms of zymotic diseases, and any suspected cause or causes of such diseases, endemic or epidemic, should be promptly reported, and at least semi-monthly reports continued, during the prevalence of such diseases, to the Secretary of the Board.

It is the intention of the Secretary, to prepare a *Sanitary Map* of the State, which will show not only the chorographical outlines of towns and school districts, but also the topographical and geological features and characteristics, of sections of cities, and school districts. It is desirable to learn the location, in all sub sections, of the natural ponds, drainable reservoirs, swamps, marshes, streams of water of any considerable size, etc., etc. Correspondents may therefore be called upon for a description of their section of territory. Envelopes and blanks will be furnished, and all postage expenses defrayed by the Secretary. Abstracts of such replies, statements, and reports, will form a part of the basis of the annual reports of the Board.

Correspondents who are unwilling their names should be used as contributors, should so state at the bottom of every report or reply, which they desire should be confidential.

In return, correspondents will receive all the Annual Reports of the Board, the Annual Registration Reports, and all circulars for popular dissemination of sanitary knowledge. They will also, thereby, discharge a just duty to their patrons and the State.

If, therefore, you feel disposed to aid the Board in the work of investigating the causes of disease, and acquiring a knowledge of the means of prevention, and are willing to be placed on the list of regular correspondents, of the State Board, you will please write your name and P. O. address on the enclosed postal card, and transmit to the Secretary by mail.

CHAS. H. FISHER, Secretary.

In response to the above circular, about sixty members of the medical profession signified their willingness to act as regular correspondents of the Board. Every one of these individuals, is a person of responsibility and high intelligence, many of them occupying positions of trust and honor, in their respective towns, and together they represent every section of the State. Upon them great reliance will be placed, in regard to the reports and statements, which it is expected they will make from time to time to the Secretary of the Board.

REGISTRATION OF DISEASE.

The *registration of disease* from carefully recorded returns, must, in the not far future, become a valuable help in ascertaining the laws of life, of health and disease. Notwithstanding, such registration has not hitherto been successfully accomplished, or indeed very earnestly attempted, it must, in the nature of things, be of especial value, when properly performed: *i. e.*, with careful statement in the returns, all the attendant circumstances of constitution and condition of soil, where disease occurs, the surrounding circumstances in regard to the presence or absence of filth, the house, surface, and soil drainage, the source and quality of the drinking water, the internal condition of the dwelling and cellar, including the means of ventilation, lighting and warming, the arefaction of bedding, clothing, walls and floors; whether dwelling of brick, wood or stone; habits of family, habits of invalid; occupation of invalid and condition of place of labor; diathetic condition of invalid and connection with previous diseases.

SANITARY OBSERVATION.

Sanitary observation and inquiry with a record of the same for report, as suggested above, will, without question, in the not far future, enter more largely into the daily practice, of the intelligent and qualified practitioner of medicine, as a means of ascertaining the cause and nature of the diseases with which he is contending. A report of the facts obtained by such inquiry and observation from a large number of intelligent practitioners, classified and tabulated, would afford a valuable means of comparison, and help dispel the mists and darkness that have hitherto hung over so many obscure maladies. It may seem like groping in the dark, but it must be remembered, that much of what is positively known, as scientific knowledge, has been reached, only by groping blindly through many devious ways, and over many stumbling-blocks. In the discovery of the causes of many diseases, we are, and shall hereafter be obliged, to proceed from the known to the unknown; by comparison of known facts, we come in possession of definite propositions, and reasonable premises for the deduction of logical inferences, just as the astronomer, by the perturbations of some celestial body, infers the existence of some other body of like character in its immediate vicinity, and thus, moved by his reasoning, makes persistent search, and is rewarded by the discovery of the previously unknown or unseen body.

It is a common observation among physicians, that locations vary greatly in the peculiar characteristics they give the diseases occurring in them, not the endemic alone, but frequently, distinctive characteristics among the manifold types and grades of common diseases, which, if not apparent, are reasonably believed to be dependent on some local cause unknown. These characteristics in many cases, make all the difference between life and death. Will it be said the causes of such characteristics cannot be discovered? or if found cannot be removed?

It has seemed to me, that in order to determine with any fair degree of exactitude, the influence of local conditions upon the production or virulence of disease, especially such as might be dependent on the natural features of any location, that there should be a sanitary survey of the State, chorographical, topographical and geological. Such a survey would result in the production of a set of

SANITARY MAPS OR CHARTS

of every township in the State. Each township should be divided topographically into sections; wards in cities, and school districts in towns where they exist would answer very well. On these maps should be shown the geographical features, the boundaries of sea-coast and tide-water, when existing; the course of rivers, the ponds, the ranges of hills and their altitude and direction, the large plains, the deeper valleys, the low wet lands and swamps, the forests and wooded lands. The topographical features should show the location of villages, the location, size and kind of manufacturing establishments, the boundaries of wards in the cities and school districts in the towns.

With a township map, say two by three feet in dimensions, having the foregoing specifications for a basis, the geological formations may be designated by various transparent colors, and with dots, or lines with different inclinations to distinguish surface soil, subsoil or underlying rock. Arbitrary characters, letters and figures, may be used to denote the average humidity or aridity of the soil, the source and kind of water supply, the facilities of surface or sewer drainage, the location of special deposits of vegetable and animal refuse and excreta, and such industrial establishments as are believed to be detrimental to the health of the public in their immediate vicinity.

Reports from physicians of disease or death, with a few facts connected therewith, stating what part or location in any certain town section, school district, village or ward the disease or death occurred, and received by some officer appointed for that purpose, and with the map before him, could be easily classified and compared, in connection with the geological formations and conditions, and the local surroundings. By such an arrangement the physician would be relieved of a very considerable amount of irksome labor, and could with very little time and attention, report every month upon the back of a postal card having upon it printed questions for the purpose, the said postal to be furnished by the State free of expense. The summing up of the facts, derived from such reports for a series of years, must certainly furnish very reliable data, for deducing conclusions in regard to many of the vexing problems, now presented the profession for solution.

By reports like those alluded to above, and by returns of deaths and causes of deaths as now and may be hereafter required by law, the physician can serve beneficently the State, and meet one of its just claims, and also serve humanity.

DISSEMINATION OF INFORMATION.

It is the purpose of the Board to "publish and circulate from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, in such form as shall be least expensive, and reach the largest number of citizens. In pursuance of the same, there was prepared and published in the month of June, ten thousand copies of a four page tract, which was as follows:

OFFICE OF THE STATE BOARD OF HEALTH.

PRACTICAL SANITARY HINTS.

PUBLIC HEALTH TRACT No. 1.

The advancing heat of summer warns us to take reasonable precautions against the advent of those destructive diseases of the season, that every year carry so many into untimely graves.

These diseases: Diarrhea, Dysentery, Cholera, Cholera Morbus, Cholera-Infantum, Typhoid Fever, etc., are almost wholly affections of some portion of the intestinal canal. Such being the facts, the natural inference would be, that they were caused by some errors of diet and regimen. While it is true these play a very important part in the production of disease, there are other morbidic materials, which, absorbed into the body by the lungs or skin, or taken into the stomach, become equally active agents directly or indirectly, in the causation of disease. Among them are the noxious gases, gaseous poisons and disease germs or particles, that float in the atmosphere or in the water we drink. Now, whether disease arises from the inception of minute living germs, or poisonous inorganic particles, or poisonous gaseous fluids, it is known beyond question, that whatever the agents are, they may and do emanate from fermenting and putrifying decomposition of animal and vegetable refuse.

FILTH,

wherever found, on the surface or in sewers, soil pipes, sink drains, cesspools, privies, pigsties, house yards, courts, alleys or cellars, is a prolific head source of much of the suffering and disease that affects humanity. The destructive influences of the effluvia of decomposing filth, have been far too little known, and therefore too little regarded, by the general public. While from their baneful effects none are exempt, their direst influences are visited upon those of least vital resistance, namely, children and invalids. The heat of summer greatly favors decomposition of all refuse matter, and many a child and invalid, will be laid away in the graveyard, during the present heated period of the year, the victim of summer disease caused wholly or in part by the gases of putrifying filth. We rush to the rescue of drowning men, we intercept the blind walking toward the

edge of a wharf or precipice; why neglect to rescue the multitude from death little less certain, and much more painful and lingering?

In the cities with compact population great care must be taken to *remove wholly* all manner of decaying rubbish, garbage or vegetable refuse to places where it may be out of harm's way, or be utilized or reduced to ashes. Removal is far better than disinfection, which is quite uncertain, and deodorization, which is in most cases more or less incomplete. Heating or burning is the most absolutely effectual appliance. Where high degrees of heat cannot be applied, and frequent removal is impossible, then deodorizers and disinfectants must be freely employed, every three or four or more days as occasion may demand.

USE OF DEODORIZERS AND DISINFECTANTS.

A few only of these agents need be named. For privies, cesspools and open sink drains, one pound of Sulphate of Iron (green vitriol or copperas) to one gallon of hot water should be freely applied to every inch of surface, with a whisk broom or sprinkler, or a coating of wood ashes, or sifted hard coal ashes, perfectly dry from time of burning, should be as frequently applied as suggested above. These articles are nearly, and perhaps quite as effectual as any others, and have the advantages of extreme cheapness, perfect safety in use, freedom from odor, and convenience of obtainment everywhere. One pint of Liquor Chloride of Zinc in two gallons water, in one pail, and one pound of Chloride of Lime in another pail full of water, applied as above, the second immediately after the first, will very nearly if not effectually destroy all the odors of putrefaction. One pound of crude Carbolic Acid (sold in pound cans) to twenty gallons water, used in the same way, will produce like results. The Carbolic Acid solution just mentioned, one gallon added to the Sulphate of Iron solution two gallons, will make a very effectual application. And so also the Chloride of Lime solution followed by the Sulphate of Iron solution. The Liquor Chloride of Zinc, having no odor of itself, makes a very agreeable as well as effectual wash for deodorizing sinks, sink spouts and closed sink drains; should be used, one pint to three or four gallons of water.

Most of the solutions above named will corrode tin vessels, if kept in them long, destroy colors of cloths or paints upon which they remain in contact, and the copperas will spot white and colored cloths, and white colors generally, all of which may be avoided by care. Earthen or unpainted wooden vessels should be employed for large or long use.

VENTILATION OF SOIL AND SEWER PIPES.

All closed cesspools, sink or soil drains and sewer pipes, should be ventilated outside the house, by ventilating tubes or pipes opening above the eaves. Water traps of every kind have been found insufficient, in any kind of unventilated pipe or sewer, to prevent the inflow of poisonous gases, by permeation through the fluid of the traps, from the expansive force of the gas, and the lighter air of heated rooms.

Outside the cities and more compact and larger villages, the dangers from the effluvia of cesspools, privies and other out-door decaying filth, are commonly supposed to be less, because more widely separated, and more largely diffused

and dissipated in the common air; but if these were facts, they by no means imply the absence of danger, or exemption from the necessity of the employment of the same measures recommended above; because, while the effluvia of filth may be so diluted by large volumes of pure air as to be practically less observable and perhaps less harmful, except when in its immediate current, there is another danger, less suspected but not less deadly in its noxious effects.

CONTAMINATED WELL WATER.

There is death in the well. Subtle poisons may lurk in the well water, unperceivable to sight, smell or taste. Wells, it must be borne in mind, drain an area of surface around them, in ordinary soils, of a distance equal to their entire depth, and may drain directly from sources of pollution a distance of many times their depth, by strata of rock or clay, inclining toward them, though the surface drainage or inclination may be away from them. It will be evident that the danger will be very considerable, from privies, cesspools and all other collections of putrifying filth within a distance at least equal to the depth of the well, which are either upon the surface, or nothing but openings or holes or depressions in the soil, subjected to the heats of summer, and leached day after day by rainfalls and the usual fluids, the resulting polluted and pestiferous lye, percolating through the underlying earth down to the bottom of the well. While soils are to some extent the natural filterers and purifiers of water, some are but slightly such, and none can wholly filter out the subtle poisons that result from putrefactive decomposition of accumulated filth. For such accumulations, until better arrangements can be made, prompt and frequent removal and complete disinfection while remaining, are imperatively demanded for safety to life. On premises where no abundant water supply is obtainable, with free drainage by sewerage, by which all night soil, house refuse and filth may be completely conveyed beyond harm, all privy vaults, cesspools and other receptacles of filth should have free ventilation and be water tight, their contents kept from fermentation by dry earth, dry unleached ashes or copperas, or carbolic acid solution, and their contents frequently removed. Barrels that are strong and tight may be cut in two in the middle, and each half used, slid beneath or hung inside of privy vaults, or water-tight boxes of size requiring frequent removal, used in the same way. If the contents are to be used for fertilization, the carbolic acid solution should be omitted.

UNCLEANLY CELLARS.

There is another source of danger to life in the cellars. Death has come through the cellar to slay thousands upon thousands. Cellars with soil bottom must of necessity be damp, because like wells they drain the earth around them. Cellars that retain water for some weeks and are muddy a considerable part of the year, are among the most hazardous of household dangers. There is a kind of exhalation from the earthy bottom of such cellars, independent of any filth, called ground air, which is very detrimental to human health and especially promotive of pulmonary consumption. All cellars should be kept dry as possible by thorough drainage. But the warmth and moisture of all cellars, however well drained or cemented or both, favors the decomposition of the refuse of storage

vegetables, and whatever droppings there may be of meats, butter, lard, cheese, or other animal products, and which emit gases dangerous to life. A prominent physician reports the occurrence in the north part of the State of twenty-seven cases of severe typhoid fever, some of them fatal, the direct result of the unhealthy influences of a damp and uncleanly cellar.

To prevent the emission of ground air or soil moisture from the cellar bottom or sides, the sides must be laid in good hydraulic or asphaltic cement, and the bottom in the same, or in alternate layers of asphaltic cement and felt saturated with bitumen. Good ventilation, however, will greatly obviate the necessity of cementing, but absolute cleanliness is indispensable. As the warm season approaches, sweep up and remove every particle of refuse, let in plenty of light and air, wash the walls with a solution of copperas, (one pound to a pailful of boiling water,) first with a stiff broom and then with a mop, and finish with a thorough whitewash of lime.

NEGLECTED PROVISION CLOSETS.

Disease is also sometimes caused by half cleaned or neglected cupboards, closets, pantries, or provision rooms, where bits and crumbs are left to decay.

It is not necessary, however, that contaminated water, or the effluvia of surface or pooled filth, or uncleanly cellars or pantries, should be sufficiently poisonous, to produce *directly* and obviously the common diseases of summer, to be sources of danger; for other derangements of the human economy, varying with the constitutional peculiarities of individuals, may be as easily induced by the same causes; and in the absence of any or all acute diseases, it is quite probable that very many of the obscure ailments of numerous persons, not immediately dangerous, have the same origin, and are consequently so perpetuated; making the victim's life almost intolerable with aches and pains, and functional disturbances of the nervous system, the stomach, bowels, kidneys and other organs, almost endless.

The great, the indispensable remedy is cleanliness, and not only of inanimate but of animate bodies also, for filth is the same disease-producing agent, whether upon the surface of the earth, or in or about the habitations of man, or incrusting upon the surface of human bodies.

HEAT AS A CAUSE OF DISEASE.

Among other agents directly promotive of summer diseases, notwithstanding the apparent exceptions, high degrees of atmospheric heat hold an important place. The sudden advent or a long continued high degree of heat debilitates the nervous system and digestive organs of susceptible persons, and persons reduced by fatigue or other causes, consequently, indulgence in the same quality and quantity of food, ordinarily taken with impunity, would be oftener followed by indigestion and some form of derangement of the stomach and bowels, resulting in congestion or inflammation of a higher or lesser degree. The preventive is obviously a sparer, more nourishing and more easily digestible diet. Of the diseases of summer, Cholera Infantum is the one most fatal and most intractable. This disease seemingly holds a very steady and definite relation to high degrees, or sudden alternations of heat. The greatest care must be taken to adapt the

quantity and quality of the food of young children, to the varying conditions of the atmosphere. Instead of waiting until serious illness occurs to call the family physician, let him be called early, to prescribe, not drugs, but modes of management of diet, exercise, exposure, clothing, and personal cleanliness to meet the varying changes of the season; and among, and not the least of the duties of the physician, will be the sanitary inspection of the dwelling, the water used, and the surrounding premises. It seems hardly necessary to allude to the dangers of eating unripe fruits and vegetables, the drinking largely of iced beverages, exposure to damp and cool evening air thinly clad, or lying on the ground in cool places, and especially sleeping with insufficient covering in open rooms, subjected to the frequent sudden cooling of the night air. An ounce of prevention is better and far cheaper than a pound of cure.

This tract was circulated freely in every portion of the State, and by reason of the influx of summer visitors, at the numerous places of resort by the seaside, and on Narragansett Bay, found its way into distant States and cities, and many letters of commendation were received by the Secretary from parties in the middle and western States.

Several applications for packages of from fifty to one thousand, were received with tender of payment, but none could be furnished, as they had been distributed in the State. Leave was given in one instance to republish, to a party in one of the smaller cities of New York.

In November, the Secretary was authorized to prepare the manuscript of another four page tract. This was done, and at a subsequent meeting of the Board, the Secretary was ordered to procure the printing of ten thousand copies for popular distribution. This tract was as follows:

FROM THE OFFICE OF THE R. I. STATE BOARD OF HEALTH.

RESTRICTION AND PREVENTION OF SCARLET FEVER, DIPHTHERIA, SMALL POX, AND OTHER INFEC- TIOUS DISEASES.

PUBLIC HEALTH TRACT No. 2.

Good personal health, is the foundation of individual enterprise and success. Individual health in the aggregate, is public health.

Good public health, is the essentially solid basis of national energy and prosperity.

A nation of invalids is already in its decline. A nation of universally able-bodied citizens, in the fullness of physical and mental health may defy adversity.

How to prevent the occurrence of disease, and acquire, and preserve good health, is one of the most important studies of modern times. It is not only engaging the attention of the Medical Profession, but also that of advanced and thoughtful minds in every community.

Fortunately it is one, in which every intelligent individual can readily engage, and also one, which every person is under imperative moral obligations to pursue.

No person can rightfully allow himself, his family, or his neighbor to become sick, when such sickness can be prevented by reasonable precautions.

The design of this tract is to show in what way, many cases of contagious disease, may be prevented from spreading through a whole community, or lighting up the disease at some future time or in some distant place, by restricting the infection to the original cases.

The directions given will have particular reference to Scarlet Fever. This disease is also popularly known under the different other names of Canker Rash, Scarlet Rash, Putrid Sore Throat, Scarlatina, etc., all and singular of which are produced by one and the same poison, and are capable of reproducing the same, and consequently infecting other persons with the same disease.

It is not a long time since prominent physicians had doubts of the contagiousness of Scarlet Fever. The proofs of communicability, have however so multiplied in a few years of close observation and investigation, that the question seems now to be definitely settled.

Scarlet Fever is caused by the introduction within the body through the lungs, stomach or skin, of specific poisonous particles of matter, or organic germs. Individuals vary greatly in their readiness to receptivity of the disease germs, and their susceptibility to the effects of the inceptive action. But whatever the degree of the disease, the same poisonous germs are reproduced, with equal power to produce the disease in other persons.

The excretions or waste material from the bowels, kidneys, skin, lungs, mouth, and nostrils, contain and carry out of, and away from the body, these particles or germs of the disease, which are so exceedingly minute in size, that they have never yet been detected by microscopic observation, and so light, as to float in the air for long periods of time, and for long distances, without having their poisonous qualities or vitality destroyed, by the moisture or dryness, the heat or cold, or the ordinary gases of the atmosphere.

These germs, by their exceeding lightness, may separate from any of the emanations from the body, either after having been thrown out upon the surface of the ground, and rising therefrom to be wafted away in the currents of the air, to infect some other person or persons, weeks or months afterwards, and scores of miles away, or, separating immediately in the sick chamber from the breath, perspiration, scaling off, or other discharges from the body, may rise and floating about in the room, infect some unwary caller, or find lodgment in some nook or crevice, or on some shelf, moulding, sash, ornament, curtain, drapery or other clothing, to be again dislodged from their resting places weeks, months or years afterwards, to affect some casual visitor or new occupant, or be carried away in articles of furniture, ornament, or wearing apparel, to spread infection and carry dismay to other persons, and in other localities.

Scarlet fever is one of the most fatal of contagious diseases.

By the census of the United States for 1870, the mortality from this disease for the previous twenty years, is stated to average about one to every twenty from all other causes.

But it is needless to go to statistics, to prove the necessity of all reasonable attempts to check the progress of the malady.

When, therefore, it is ascertained, that a member of the family is affected with the disease, let the following directions be observed and carried out, as far as circumstances will permit, under the supervision, and modification, when needed, of the physician in attendance.

A close observance of them will be attended with considerable labor and inconvenience, but it must not be forgotten, that no person has a right to injure his own family, his neighbor, or his fellow man anywhere, by willful or indolent neglect of known duties.

1. *Entire separation of the sick from all other persons*, except such as are absolutely required for attendance and nursing. Nothing can compensate for this precaution, for the restriction of the disease, and the welfare of the patient.

2. *The patient should be taken to a dry, well ventilated, and properly prepared apartment.* An upper room is dryer, and safer as well as more airy than one near the ground. The thermometer should be kept between 68° and 72° F., as nearly as possible during the heated stage, and about 76° thereafter.

All furniture not really needed, all ornaments, pictures, books and maps, all valuable carpets, drapery or other cloth material that might be damaged by fumigation or disinfection, and all furniture upholstered with cloth, should be entirely removed.

All large furniture not removable except with great difficulty, may, however, be covered with paper, and the paper covered with cloth, all which can be carefully removed and destroyed after the termination of the sickness.

Pieces of carpet and old rugs may be used to cover the naked floor and disposed of as above, or disinfected by fumigation or heat. Fresh air should have free access to the room, special care being taken to protect the patient from currents or drafts, or sudden introduction of large volumes of air of lower temperature than that of the room.

3. *The bed provided should be elastic and cool.* Soft feather beds, or any into which the body of the patient sinks, are entirely inadmissible. Rubber sheets or other covering of firm material, laid over the bedding, drawn tight, and securely fastened to the sides of the bedstead, to prevent sinking down of the body, should be used when mattresses cannot be obtained. Rubber sheeting, properly applied, is a very effectual protection of the under bedding.

4. *Attention to cleanliness and disinfection is indispensable.* The body and bed linen, and all larger clothes, should be frequently changed and immediately on removal, immersed in vessels containing a disinfecting solution, (Liquor Sodæ Chlorinatæ one quart, water four gallons,) which should be kept in or near the room for the purpose of retaining soiled clothes until opportunity occurs for thoroughly boiling for at least one hour.

Heat above the boiling point, whether by boiling or baking, is a powerful disinfectant, and effectually destructive of contagion germs. The clothing of nurses and attendants should also be disinfected before coming in contact with persons liable to infection, and the above precautions should be continued until the period of peeling or scaling of crumbled scurf skin has ceased. *These fine branny or mealy scales are especially dangerous as carriers of the contagium of Scarlet Fever.*

Cotton clothing is much better than woolen for use in the sick room, being less likely to entangle and hold the scales or germs of contagion, and also more easily disinfected.

The hands should be washed with Carbolic Acid Soap, or in diluted Chlorine Water, (one ounce to half pint of water,) or diluted Bromo Chloralum, (one ounce to half pint of water). The last is free from any odor. The body of the patient should be bathed at least once in twenty-four hours in the solution (Liquor Sodæ Chlorinatæ one-half ounce, water one pint,) until cessation of peeling.

5. *All the larger discharges from the nose or mouth, and all the stools and passages of water, should fall into vessels containing at least a half pint of a solution of green copperas, (one pound copperas to one gallon of hot water,) and carried at once to some distance from the house and covered if possible with a light coating of dry earth. Keep out of streams of water, and away from the vicinity of wells. If water closets or privies must be used, let them be frequently and thoroughly disinfected. (See Public Health Tract No. 1.)*

Good napkins and handkerchiefs should not be used for the smaller discharges from the mouth and nose, but instead small pieces of cotton cloths, which may be burned immediately after use.

While good ventilation is indispensable in the sick room, some benefit may doubtless be derived from the diffusion therein, of some disinfecting gas like chlorine or ozone. Saucers partly filled with Chloride of Lime may be set in different places in the room upon which a teaspoonful or two of good sharp vinegar may be turned every three or four hours. The Lime should be renewed when it ceases to give off the gas. Cloths may be wet with Liquor Sodæ Chlorinatæ (one part to three of water,) or if Chlorine gas is very offensive to the patient or attendants, the cloths may be wet with the Bromo Chloralum, which is without odor, (one part to four of water,) and hung up in different parts of the apartment.

6. *After the complete termination of the disease, all the contents of the sick chamber, all the material of every kind whatever, used during the sickness and remaining in the room unprotected, and the floor, walls, windows and ceiling of the room should be thoroughly disinfected by washing, fumigation or heat. Whatever is of small value had better be burned. The rooms should be washed thoroughly in every part with the following solution: (Sulphate Zinc, half a pound, crude Carbolic Acid one ounce, hot water, two gallons.) When practicable, the walls and ceilings, should be lime washed or kalsomined.*

To fumigate a room with Sulphurous Acid gas, the contents must be so arranged that the fumes may come in contact with the entire surfaces of all the articles to be disinfected, as well as sides of the apartment.

Across a tub partly filled with water, place a pair of tongs or other support, for an iron basin or skillet, or thick earthen pan. Put in the basin or pan, a layer of ashes one inch thick, then a few bright live coals, upon which scatter at least one pound of powdered or crushed sulphur. Close the apartment tight, and leave for twenty-four hours. Then ventilate freely.

To disinfect with heat alone, large ovens must be used, and the temperature carried up to a degree, at which bread would be rapidly baked, and continued for one hour.

In case of death, the body should be wrapped in large cloths, thoroughly saturated with a strong solution of Chloride of Lime or Soda and placed in a coffin as soon as possible.

Funerals of persons dying of contagious diseases, had better be held elsewhere, than at the residences of the deceased, and an open coffin should never be allowed.

Whenever a virulent contagious disease occurs in any community, it is the duty of all citizens to coöperate with the afflicted family, in repelling the attack of the invader, and confining the disease to the first cases.

To avoid attacks of infectious diseases, the directions suggested in Public Health Tract No. 1 should be strictly observed. Breathing air containing sewer gas, or any gases of decay, or exhalations from any form of filth, in cesspools, water closets, sinks, foul cellars, or uncleansed animal bodies, or repeatedly re-breathing one's own breath, or the breath of others in closed rooms, *especially in closed bed-rooms through the night*, are unfailing sources of deterioration of general health, and whatever impairs general health, lessens the natural vigor of the individual, lessens the power of resisting the attacks of any disease, and especially predisposes to attacks of infectious maladies, like Scarlet Fever and Diphtheria, and also greatly increases the liability of death.

While the above suggestions have particular reference to Scarlet Fever, many of them will apply equally well to other forms of contagious diseases. Small Pox preëminently, requires the same management.

Paragraphs numbered one, two and three, are applicable to nearly all forms of dangerous maladies, while *the first section of paragraph 5 has especial applicability to typhoid fever, and nearly all will apply equally well to diphtheria.*

Doubtless some will question the necessity of such sweeping precautions, but it may be suggested that to the neglect of such precautions, may be due in a great measure, the continued existence of infectious diseases, whether in isolated or in epidemic visitations, and if preventable diseases are ever to be stamped out of existence, it can be accomplished only by such vigorous measures, as will effect the destruction of the disease producing germs, in their infancy.

The word "*germ*" was used in the above tract, as being probably the best, to convey to the mind of the average reader, the idea of a

minute material particle or atom, which is the individual contagium, whether organic or inorganic, that causes the disease, and not as a *vital organism* whose existence has been demonstrated.

This tract will doubtless challenge criticism. It is hoped it will excite sufficient interest to lead to extended investigation. It was written with deliberation, with consultation of Reports of the Medical Officers of the Privy Council of England, and of many of the leading medical authorities of Europe and America. It will stand.

Other tracts may follow from time to time, and information will also be given by circulars or otherwise, to such parties as may seem, on account of official position, to need specific instructions.

CATTLE COMMISSION.

Upon the organization of the State Board of Health, the duties that had previously devolved on that special board, known as the Cattle Commission, seemed to demand the most immediate attention. The alarming increase of that utterly incurable, and highly contagious disease called glanders or farcy, among the horses of the State, for the previous year or two, had called for prompt and stringent measures for its extirpation or restriction, and the former Cattle Commission, through several agencies, had been moving actively in that direction.

As elsewhere reported, the Board of Health resolved to continue the same agencies until further consideration, and the regulations adopted by the former Commission, were also adopted by the new Board as of their own.

These regulations were ordered to be advertised in several of the newspapers of the State, as had previously been done, and the advertisement was as follows:

RHODE ISLAND STATE BOARD OF HEALTH.

GLANDERS IN HORSES.

At a meeting of the State Board of Health held Monday, April 22, 1878, the following regulations were adopted and ordered to be published:

1. The owners of, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy, shall keep such horse or other animal apart and separate from all other horses or animals.
2. The owner, or any person having the care of any horse or other animal, knowing the same to have the disease called glanders or farcy shall not lead, nor drive, nor permit such horse or other animal to go in or over any public street, road, lane or highway in this State.
3. Any veterinary surgeon or other person who shall have knowledge of any horse or other animal that has the disease called glanders or farcy, shall report the existence and location of such case of disease, to some member of the State Board of Health within twenty-four hours after receiving knowledge of the same.

The penalty for failure to comply with the above regulations, as fixed by Section 8, Chapter 76, of the General Statutes, is a fine not exceeding three hundred dollars, or imprisonment not exceeding one year.

The first section of the same chapter provides that any person who shall knowingly expose a horse or other animal having any infectious or contagious disease

to other horses or animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

Section 7 provides that any person who shall sell *or offer to sell any horse or other domestic animal* known to him to be infected with any contagious disease, shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

Subsequently, the cost of advertising was found to be assuming such large proportions, that some other and more economical way of bringing to the notice of the public at large, the regulations adopted by the Board, seemed to be advisable. At a meeting in which the subject came up for consideration, the suggestion was made that placards, posted in public places, like post offices, stores, livery-stables and repair-shops of various kinds, would be a quite permanent form of advertising, and less expensive than advertising through the newspapers, and the following resolution was adopted:

Resolved, "That the Secretary of the Board be requested to present for the consideration of the Board, at its next meeting, suitable suggestions as to the duties and purposes of the Board, for the information of the people of the State, and also condensed regulations in regard to contagious diseases dangerous to life among animals, to be printed on posters; also, to present samples and styles of posters most suitable for the purpose together with the prices of the same."

At a meeting of the Board on the week following, the Secretary presented a report as directed, and it was voted "that the regulations be adopted, and that they, together with the suggestions to the public in regard to the duties and purposes of the board, be printed, on posters as per samples presented by the Secretary, 500 on plain paper, 500 on cloth and 500 on card-board."

The order was carried out by the Secretary, and the posters read as follows:

STATE BOARD OF HEALTH.

In order that there may be no misapprehension in the public mind in regard to the purposes of this department of State government, attention is called to the following sections of the Act establishing the Board :

SECTION 3. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascer-

tain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

The work proposed is large in scope and will require extended inquiry and observation. Large immediately beneficial results cannot reasonably be expected. The Board will, however, prosecute the work with all possible diligence. For the accomplishment of its purposes the Board will need the hearty coöperation, not only of physicians, but of intelligent citizens also, in every community. Circulars, each containing a series of questions, will, from time to time, be distributed to regular correspondents in every town in the State, and will eventually cover the whole field of inquiry. The range of questions will be large, and the replies, in all cases, must be the result of intelligent observation. All knowledge is the result of observation, the collection and collation of facts. Sanitary science is no exception. Observed facts elicited from all parts of the State in regard to the prevalence of certain diseases, the accompanying meteorological and geological phenomena, the local conditions as to haze, dust and filth, the decomposition of animal and vegetable refuse, etc., will furnish, when collected, arranged and compared, a basis for sanitary law and judicious sanitary action. It is believed that the Board of Health can become a most efficient arm of State service, and eventually save the State annually from one-quarter of a million dollars upward. To do this there must be an interest on the part of the people. Town boards of health and village health clubs must be formed. Forms of association and methods of investigation will be suggested for such organizations, by the Secretary of the Board when desired.

All persons are requested to communicate the existence of any and all facts or circumstances to them known, prejudicial to the public health, to some member of the State Board or Secretary.

The Board have adopted the following condensed regulations in regard to contagious diseases among domestic animals:

1. No person having the care or ownership of any horse or other animal, having the disease called glanders, or any other disease highly contagious and dangerous to life, shall sell or offer for sale, or permit any such animal to go into or be in any public lane or highway, or expose or keep any such animal within the same building, or within fifty feet of any other animal not so infected.
2. Any person having knowledge of any disease or any facts as set forth in the preceeding section, shall report the same to some member of the State Board of Health immediately.
3. Non-compliance with the above regulations subjects the offender to a fine

not exceeding one thousand dollars, or imprisonment not above one year, or both at discretion of court.

The names and post office address of the members of the Board are as follows: David King, Newport; Elisha Dyer, Jr., Wickford or Providence; Charles H. Fisher, North Scituate; George W. Jenckes, Woonsocket; William T. C. Wardwell, Bristol; Albert G. Sprague, Centreville.

By order of the State Board of Health.

DAVID KING, Chairman.

CHARLES H. FISHER, Secretary.

PROVIDENCE, R. I., May 16, 1878.

It will be seen that the form and phraseology of the new regulations, differs from the others, in that they cover other diseases besides glanders, that the question of a party knowing a horse or other animal to have the disease called glanders, is left to be settled by evidence in court, and the penalties are given in a few lines showing the greatest amount of fine and imprisonment, for any one offence.

These posters were put up in conspicuous places in all parts of the State, and while the expense was less than advertising in the newspapers while that continued, the posters are still a standing advertisement in all the places where put up.

The occurrence of cases of glanders, in locations distant from the Secretary, or other agencies heretofore employed for their effectual disposal, led the Board to adopt the following rule soon after their organization:

"Any member of the Board is authorized, on information received, to order the examination of any animal suspected of having a contagious disease, dangerous to life; and has hereby also authority to order the killing and burying of any such diseased animal, when deemed advisable."

This rule has been of special convenience in several instances, and a saving of expense to the State.

In regard to the examination of horses suspected of having glanders, by veterinary experts, the following rule was adopted:

"The fee of two dollars shall be the maximum sum allowed for the examination of any horse, having or suspected of having the disease called glanders, and such sum for transportation as will cover the expense of nearest public conveyance thereto, except for such cases as shall seem exceptional in the judgment of the Secretary."

It has been suggested, that when any person had suspicions that a horse or other animal of which he was the owner, or had in charge, had glanders or other contagious disease, dangerous to life, he should at once obtain the opinion of some veterinary surgeon, or expert of recognized skill, and that the fee for such examination be paid by the State, as an inducement to early and prompt action. It is probable, however, that if arrangements were made with responsible experts, by which their fees for examining animals suspected of virulent and contagious disease, should be paid out of the State treasury, that there would be many persons who would discover in such arrangement the opportunity for ascertaining from the best veterinary skill, an opinion in regard to some other form of disease from which their animals were suffering, and that without personal expense. Even if the experts were forbidden to give any but negative opinions in regard to the maladies of animals examined, when not proving to have contagious diseases dangerous to life, there would still be opportunities for fraud unless with the restriction that all parties, suspecting their animals of having such diseases, shall apply to any member of the State Board of Health, or its Secretary, or the Agent of the Society for the Prevention of Cruelty to Animals, for an order for such examination. And that is practically the case now. For any person presenting an animal having suspicious symptoms of disease, dangerous to other animals, to any one of the parties above named, can obtain an order for an examination by a responsible expert, and that without expense to the applicant.

The great difficulty, however, in regard to glanders in horses is, that nearly all persons suspecting the disease in an animal which they own, not only do not wish to know the fact themselves, but are extremely anxious it should not be known to others. The intention is to trade off the horse as soon as possible, and realize something, or keep him at work as long as his work will more than pay for keeping.

Horses are sometimes bought by small traders, which are known or fully believed to have glanders, for the purpose of speculation. They are given rest, fed well, have the nostrils sponged with a wash that dries up the secretions temporarily, and are then brought into the market, each with a shiny coat, a clean nose, a good harness on, and attached to a respectable carriage, and some unwary buyer is victimized.

The idea of endangering the health of other animals, or the property of other persons has very little consideration.

AGENCIES EMPLOYED.

As previously reported, the State Board of Health, in assuming the duties of the Cattle Commission, resolved to continue the agencies already employed by the previous Board of Commissioners, until further consideration. Notably among those who had called the attention of the former Commission to the alarming prevalence of glanders among horses, was Dr. N. A. Fisher, General Agent of the Society for the Prevention of Cruelty to Animals, and to him were the Commission chiefly indebted for the discovery of the cases of that disease which came to their knowledge. His position and occupation afford great facilities for that purpose. He was therefore desired by the Secretary of the Board, to continue to render the same assistance he had previously rendered the former Commission, which he readily assented to, and has to the present time, actively coöperated in many ways, to make the work of the Board as effective as possible. His report, dated January 5, 1878, is included in this report, as it gives information which will be of interest to a large number who have never seen the report then given, and is as follows:

R. I. SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, }
 PROVIDENCE, January 5, 1878. }

EDWIN M. SNOW, M. D., *Chairman of Cattle Commission* :

SIR:—Last June we called your attention to the prevalence of glanders and farcy in the city and country. This led to the adoption of measures by the Commissioners to prevent the spread of the disease; and for this purpose you requested that the Agents of this Society should carefully investigate all cases reported to them, or that might come within their observation, giving directions how to dispose of them, and that a record should be kept of the same. This has been done, and the following report will show the results to this date:

But it may be well to state in the first place, that although our statute does not authorize us to interfere when animals are suffering from diseases of any kind, unless connected with them some act of cruelty is alleged, we have always taken particular notice of all cases of glanders or farcy, that have come to our knowledge, and have entered them in our records; consequently we are able to give some idea of the extent to which they prevailed during the six years preceding the last, and we find recorded in all seven cases, as follows: In 1871, none; in '72, one; in '73, two; in '74, three; in '75, one; in '76, none. Of these—all found in the city—five were destroyed, and two were got off into the country before the proper authorities could be moved to secure them.

The whole number of cases of glanders and farcy that have received the attention of the agents of this society from April, 1877, to January, 1878, is twenty-one. Of these, nineteen were killed; one was stolen away after he had been seized by the agent, and one was by permission taken to Massachusetts, where he came from, the owner wishing to try some experiments in the way of treatment, and having given assurance that he should in the meanwhile be placed where he could not endanger other animals.

In eight of the cases, glanders alone was developed; in four, farcy alone; and in nine glanders and farcy existed together. Nine were owned in the city, one in East Providence; one in Pawtucket; one in Centredale; one in Cumberland; one in Burrillville; two in Coventry; five were found on the Cove lands, brought there by the horse traders; two of them from Johnston; one from Cranston; one from Voluntown, Conn.; one from Massachusetts.

Some were in good condition, well used and well cared for; but a majority were old, ill-fed, over-worked and sadly neglected.

How the disease became so prevalent, may be explained, in part, by the following facts: The first four cases were taken from the dealers in old horses; where they came from, or when they came into the State, could not be ascertained; but as they were moved about from place to place, and sold from one dealer to another daily, they no doubt did much to spread the contagion. In June, a circus, with a large number of horses and mules traveled through the different towns, and it was noticed while they were in the city, that many of the animals were affected with something like glanders. It no doubt was glanders, as a few days after it was discovered that the company sold a pair of mules when at Phenix that had the disease in its last stages, and these must have helped to extend it. Thus glandered and farcied animals have been found worked and driven on the streets, spreading the poison by contact, leaving it at the public watering places, at the hitching and standing places, and wherever they went. In some instances there has been utter neglect to purify the stalls, stables, &c, from which diseased animals have been taken; and much evil has been done by men called "horse doctors," whose ignorance and presumption are only equalled by the confidence of those who employ them. We have found horses, some with glanders in a fearful form, under treatment for catarrh, and others, with swelled legs, discharging from farcy sores, treated for sprains, and in some instances, when the disease was known, it was under treatment by the "doctors," they claiming the ability to cure it, and doing nothing in the meantime to protect sound animals from danger.

The twenty-one cases we have recorded, are not, probably, a quarter of all that have occurred in the State during the year; but they are enough to excite alarm, for of all the diseases to which animals are liable, none is more terrible.

Glanders and farcy are one and the same disease—only different developments of the same specific poison. It is contagious and infectious. Horses and mules seem most obnoxious to it, but other animals and men, may take it by contact; and to all alike it is fatal. Within the last four years, three men in this city and one in Pawtucket, have died of it, the poison having been absorbed through cuts or sores on the hands.

It is difficult to distinguish glanders in its incipient stage from a simple catarrh, and farcy may be mistaken for an injury, or cutaneous affection, not of a dan-

gerous nature. For this reason, and now especially, when the disease is so prevalent, in every case at all resembling it, the best veterinary skill should be consulted. If there is any doubt of its character, the subject should be securely isolated, until it is decided; then, should it prove to be the disease, there is but one course to pursue, the animal should be killed at once and properly buried.

To aid in extirpating the disease, all who have the charge of animals should be induced, if possible, on the least suspicion of its appearance, to have it examined by some one or more competent persons, designated for that purpose, and then be governed by the advice given. If this examination could be had free of charge to the applicant, it would be more likely to be effectual. Much might be done, also, by a careful inspection of public, and in many instances, of private stables from time to time. Then it should be seen, that there is no failure to thoroughly cleanse and disinfect the places that have been occupied by such diseased animals, and all the objects used upon or around them.

We would suggest the importance of some provision being made for the removal and burial of glandered and farcied animals. There are those who are prepared to do it, but it cannot be expected that they will perform such disagreeable and dangerous business, without pay from some one, and the owners who suddenly find themselves deprived of their horses, for no fault of their own, it may be, are often too poor to meet the expense.

N. A. FISHER,

General Agent R. I. Society for the Prevention of Cruelty to Animals.

DISCOVERY AND DISPOSAL OF DISEASED HORSES.

During the eight months the Board has been performing the duties of the Cattle Commission, the Secretary has personally visited twenty-six horses suspected of having glanders, and by his order more than two hundred horses coming into the State in troupes, have been examined as a precaution against the introduction of the disease from without.

The number of cases of glanders or farcy that have died within the knowledge, or been killed by order of, the Board or its agents, since its organization is sixteen. Besides these, information of a reliable character, gives the number of eight more, that have been inspected, killed and buried at the expense of the owner.

Many of the cases of glanders are the property of poor men who would feel it too much of a hardship, and have too little sense of responsibility, to bury the animal in a proper place and manner. It has been found best for the interest of the public, to see that every glandered horse should be buried in such a manner as to prevent the further spread of the disease from that source. Arrangements were

therefore made with Mr. W. E. Barnes of Field's Point, who had acted in the same capacity before, to take away, and properly bury in a secluded spot, upon order of the Board or its agents, all the glandered horses found and condemned in the city of Providence, and surrounding towns; and keep a record of the same, the date of death, the color and probable age, name of owner or party in possession, and last place where kept.

Among those who have rendered valuable assistance to the Board and its agents, in determining positively the character of the maladies of the diseased animals, coming under their observation, mention should be particularly made of Drs. C. H. Peabody, and C. H. Scrutton, veterinary surgeons of the city of Providence, and also Mr. Charles H. Thurber of the same city, and local agent of the Society for the Prevention of Cruelty to Animals, who has had large experience among glandered and farcied horses.

The following report of Dr. N. A. Fisher, for the year ending January 1, 1879, will give a summary of the cases of glanders, that have come within his knowledge during the year, and also presents some valuable suggestions in regard to that insidious and incurable disease:

R. I. SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, }
PROVIDENCE, January 1, 1879. }

CHARLES H. FISHER, M. D., *Secretary of the State Board of Health:*

SIR:—In compliance with your request the agents of the Rhode Island Society for the Prevention of Cruelty to Animals, have continued to investigate, to dispose of as directed, and to keep a record of all cases of glanders and farcy that have come to their knowledge since the organization of the State Board of Health, as they did previously at the request of Dr. Snow, Chairman of the Cattle Commission, and the following report is submitted for the year ending January 1, 1879:

The number of cases of glanders and farcy that have been investigated or that have come to the personal notice of the agents of the Society for the Prevention of Cruelty to Animals, during the year is twenty-five; of which three died of the disease, and twenty-two were killed. Besides these, we have had reports from reliable persons of eighteen others; making altogether forty-three cases. All were horses.

Ten of these were found in one stable, four in another, three in another, and two each in two others. Eighteen belonged in the city; one in East Providence; one in Warren; two in Pawtucket; one in Cumberland; two in Smithfield; twelve in Cranston; one in Johnston; one in East Greenwich; two in West Greenwich; one in Coventry, and one in Burrillville. This last was brought from Massachusetts to Burrillville and died a few days after. These, we believe, are about all that have occurred in the State.

From these statements it appears that while the disease has been spread over about the same territory, the number of cases has greatly decreased, there having been but forty-three cases this year to one hundred and ten the year previous. This decrease is owing in a large degree, probably, to a better knowledge on the part of those who have the care of horses, of the early symptoms of the disease, and of the importance of a prompt resort to the only means of controlling it; which are—the immediate destruction of the subject, when the evidence of the disease is conclusive, and the careful isolation of all doubtful or suspicious cases. Also to a better observance of general sanitary and suppression measures, such as ventilation, protection from the severities of the weather by proper shelter, blanketing, etc., and the more thorough cleansing and disinfection of stables and stable utensils where the disease has existed.

Undoubtedly more might have been done to lessen the disease had provision been made for a proper inspection of all stables and localities where it made its appearance. The necessity for this does not seem to be appreciated. Fleming, the best authority on this subject, says: "Horses which have been in contact with others suffering from glanders or farcy, or which are suspected in consequence of cohabitation with them, if they do not exhibit any symptoms of the disease, should remain under veterinary surveillance for a certain period, which must not be less than twenty days, and may even be extended to six months. During the shorter period they ought to be frequently inspected—at least once a week. For the twenty days they should not be allowed to mix with other horses; but if after that time, they remain in good health, they may be used in the locality until all apprehension of danger has passed away."

The removal of animals isolated or suspected, should not be permitted without the knowledge and consent of the inspector; nor should any sale of such animals be made without the knowledge on the part of the purchaser that they are under surveillance for glanders or farcy.

We would call your attention to the importance of having early reports of all cases of glanders and farcy. And for this purpose—since it cannot be expected that parties will voluntarily give information which they think may prove injurious to their own interests—to the necessity of such legislation as shall make it the duty, under penalty, of all veterinary practitioners and of all owners and persons having custody of animals, to report promptly all cases of the disease which come to their knowledge, which reports, when it is possible, shall give the name of the owner or person in charge, the time when, and place where found, and how disposed of, together with a description of color, age and condition, and whatever can be learned of its history that may aid in its extirpation.

The burial of glandered and farcied horses found in and near the city, has been done by Mr. Barnes at Field's Point, after the manner prescribed by Dr. Snow, and approved by your Board.

Whenever there has been any question on the part of the owner as to the character of the disease, we have consulted with Drs. Scrutton and Peabody, veterinary surgeons. We have also, in such cases, made examinations post-mortem; and these, in no instance, have failed to satisfy the doubts of all.

N. A. FISHER,

General Agent, R. I. Society for the Prevention of Cruelty to Animals.

CONTAGIOUS DISEASES OF OTHER ANIMALS.

In the foregoing report of the work on the Cattle Commission, reference has been made exclusively to diseases among horses. In regard to the presence of any contagious disease of a serious character among other animals, the Commission have no knowledge of any out break in any part of the State. A few cases of supposed pleuro-pneumonia have been reported, all in single cases and different localities. Texas cattle are still driven through Kansas and into the western States, contrary to law, and diseased animals are frequently found as far east as Albany, but the stringent restrictions put upon the introduction of beef, and other cattle into the States of Massachusetts and Rhode Island, have for some time been so much of a terror, to drovers and cattle merchants, as to arrest the forwarding of diseased animals into either of these States. There have been some deaths among swine, which have excited temporary local alarm. Portions of diseased organs have been brought to the Secretary for inspection, but no evidence has been shown of contagious disease among them. It is believed the State is free from any contagious disease dangerous to life among animals, except that of glanders among horses.

EXPENSES OF THE BOARD.

Envelopes and letter paper.....	\$53 15
Printing circulars, postal cards, &c.....	16 14
Paper and printing 20,000 tracts.....	99 14
“ “ Blank returns of deaths	45 74
Stamps and postal cards.....	40 00
Expressage and distribution of documents.....	3 50
Blank books, desk materials, stationery, books, twine, wrap- ping, &c.....	42 06
Six Vols. Sanitarian	20 00
Fuel.....	5 50
Salary.....	830 75

Board of Health proper.....\$1,155 98

Cattle Commission.

Advertising.....	\$77 56
Fifteen hundred posters, paper, cloth, and card board.....	36 86
Express and posting.....	10 00
Expenses, veterinary experts... ..	65 50

Total of bills rendered and certified January 1, 1879.\$1,345 90

The above expenses are less, by one copying-press returned (\$5.75), and transient material on hand, as follows: postal cards and stamps, (\$6.40); five reams and two and one-half quires letter paper; one hundred and eighty envelopes, note size, three hundred and twenty large size, five hundred and fifty yellow note; one quire large wrapping paper; twine and desk material.

The articles furnished the office by order of the Governor, are desk and table accommodations, seating, floor-covering, curtains, and usual articles for sweeping and dusting, and for sink. These are all of the most substantial character, were purchased at greatly reduced prices, and would bring, at this date—after use about eight months—probably first cost. The rest of the furnishing is private property.

BOOKS RECEIVED.

- 21 Vols. from Secretary of State, R. I. Registration Reports.
 2 " " " " Copy of Gen. Statutes and Public Laws.
 1 " " " " State Census, 1875.
 3 Vols. Chicago Reports, Board of Health, 1870-1877.
 5 " Michigan " State Board of Health, 1873-1876.
 1 " " " Vital Statistics, 1872.
 1 " Ohio " " " 1877.
 1 " Colorado " State Board of Health, 1876.
 1 " Reading, Pa., Report, Board of Health, 1877.
 1 " Surgeon-Gen. U. S. Army, Circ. No. 8, Hygiene, U. S. Army.
 1 " " " " No. 10, Plans for Hospitals.
 1 " Massachusetts Report, State Board of Health for 1878.
 2 " " " " " " 1870, Reprint.
 5 " New Haven, Conn., Reports, Board of Health, 1873-1878.
 1 " Connecticut Report, Vital Statistics, 1877.
 5 " New York City Report, Board of Health, 1868 to 1873.
 1 " " " " Sanitary Code of Board of Health.
 1 " New Jersey Report, State Board of Health, 1877.
 1 " " Instructions in Regard to Registry Returns.
 1 " " Hudson County Report, Board of Health.
 1 " Virginia State Board of Health.
 3 " Pennsylvania, Pittsburgh, Reports, Board of Health, 1875-'6-'7.
 1 " U. S. Marine Hospital Service, Nomenclature of Disease.
 1 " Wilmington, Del., Report of Water Engineer on Impurities.
 1 " " " " Vital Statistics.
 1 " Connecticut Registration Reports.
 4 " Wisconsin, duplicate First and Second, Reports, State Board of Health.
 5 " Sanitarian, Purchased Aug. 26.
 1 " In Numbers for 1878.
 1 " From Sec. State, Mass., Report of Sanitary Com., 1850.
 1 " " " " Board of Health, Mass., Seven Years' Work.
 1 " " Michigan, Report Sec. State Board of Health, 1877.
 1 " " Dist. Columbia, Report Dist. Board of Health, 1877.
 Various Blank Reports and Returns of Births, Marriages and Deaths.
 1 Vol. by purchase.—Food: Its Value, &c. By H. Letheby, Ph. D.
 1 " " Manual of Practical Hygiene. By E. A. Parker, M. D.
 1 " " Handbook of Hygiene. By George Wilson, M. D.
 1 " " Third Vol. American Public Health Association Reports.

METRIC SYSTEM.

As the *metric system* of weights and measures has intrinsic merit, and is rapidly being adopted by all scientific associations, leading practitioners of medicine and apothecaries, and by contributors to many of the public journals, it seems proper that its terms and equivalents should be brought constantly before the public eye.

The metric system was first suggested by French scientists about the year 1790, with a view of making all measures of length, volume and weight uniform throughout the world. It comprises the following units of measure:

The *meter*, the unit of length = the ten millionth part of the terrestrial meridian, or the distance between the pole and the equator = 39.370432 inches.

The *liter*, the unit of capacity = a cube of the tenth part of a meter = 1.0567454 wine quart.

The *gram*, the unit of weight = the weight of a cubic centimeter of water at its maximum density (4° Cent.) = 15.43234874 grains. In medicine, the *gram* is the unit of weight, and the *cubic centimeter*, or a measure of one gram of water, is the unit of volume; practically the two terms are equivalent, except with very heavy or very light liquids.

EQUIVALENTS.

	<i>Grams.</i>		<i>Grams.</i>
One drachm (Troy) = 480 grains	= 31.103	or about	32.
One scruple = 60 grains	= 3.888	or about	4.
1 grain	= .0648	or about	.06.
$\frac{1}{4}$ grain	= .016	or about	.016.
$\frac{1}{8}$ grain	= .008	or about	.008.

The average (household) teaspoon holds 5, and the large tablespoon 20 cubic centimeters.

LENGTH.

1 Myriameter,	Mm.	(10,000 m.)	= 6.2137 miles.
1 Kilometer,	Km.	(1,000 m.)	= 0.62137 mile.
1 Hectometer,	Hm.	(100 m.)	= 328.0833 feet.
1 Decameter,	Dm.	(10 m.)	= 39.37 inches.
1 Meter,	m.	(1 m.)	= 39.37 inches.
1 Decimeter,	dm.	(0.1 m.)	= 3.937 inches.
1 Centimeter,	cm.	(0.01 m.)	= 0.3937 inch.
1 Millimeter,	mm.	(0.001 m.)	= 0.03937 inch.

SURFACE.

1 Hectare,	Ha.	(10,000 sq. m.)	= 2.471 acres.
1 Are,	a.	(100 sq. m.)	= 119.6 square yards.
1 Centare,	ca.	(1 sq. m.)	= 1.550 square inches.

CAPACITY.

1 Kiloliter or Stere,	Kl. or st.	(1,000 l.)	= 1.308 cubic yards.	= 264.17 gallons.
1 Hectoliter,	Hl.	(100 l.)	= 2 bush. and 3.35 pecks.	= 26.417 "
1 Decaliter,	Dl.	(10 l.)	= 9.08 quarts.	= 2.6417 "
1 Liter,	l.	(1 l.)	= 0.908 quart.	= 1.0567 qts. (1.761 imperial pints.)
1 Deciliter,	dl.	(0.1 l.)	= 6.1022 cubic inches.	= 0.845 gill.
1 Centiliter,	cl.	(0.01 l.)	= 0.61022 cubic inch.	= 0.338 fluid ounce.
1 Milliliter,	ml.	(0.001 l.)	= 0.061 cubic inch.	= 0.27 fluid drachm.

WEIGHT.

1 Millier or Tonneau, M. or T.	(1,000 Kg.)	= 1 Kl. or 1 Cu. m.	= 2204.6 lbs. (avoirdupois.)	
1 Quintal,	Q.	(100 Kg.)	= 1 Hl. or 0.1 Cu. m.	= 220.46 pounds.
1 Myriagram,	Mg.	(10 Kg.)	= 1 Dl. or 10 Cu. dm.	= 22.046 "
1 Kilogram,	Kg.	(1,000 g.)	= 1 l. or 1 Cu. dm.	= 2.2046 "
1 Hectogram,	Hg.	(100 g.)	= 1 dl. or 0.1 Cu. dm.	= 3.5274 ounces.
1 Decagram,	Dg.	(10 g.)	= 1 cl. or 10 Cu. cm.	= 0.3527 ounce.
1 Gram,	g.	(1 g.)	= 1 ml. or 1 Cu. cm.	= 15.432 grains.
1 Decigram,	dg.	(0.1 g.)	= 0.1 ml. or 0.1 Cu. cm.	= 1.5432 "
1 Centigram,	cg.	(0.01 g.)	= 0.01 ml. or 10 Cu. mm.	= 0.1543 grain.
1 Milligram,	mg.	(0.001 g.)	= 0.001 ml. or 1 Cu. m.	= 0.0154 "

One kilogram is equal to a weight represented by one liter of distilled water at 4° C. In the centigrade scale 0 (32° + F.) is the freezing point; 100° + (212° + F.) is the boiling point. Five degrees C. corresponds to nine degrees F.

All measures in the metric system are derived from the meter, and their names express their values. Some of the names in the French system (like our "dime") are not in practical use; e. g., hectometer, decagram, etc.

One inch = 2.5 centimeters nearly; one quart (wine measure) = 0.946 liter; one pound troy = 0.373 kilogram; one acre = 0.4046 hectare.



Treatment of the Drowned.

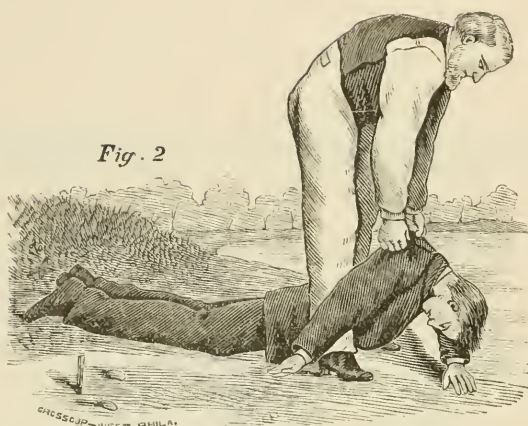
The following methods and rules were devised and prepared by a committee of the Michigan State Board of Health, and are a modification of those previously prepared by Dr. Beech of Coldwater, Mich., and of those published by the Life Saving Society of New York. They have the sanction of other State Boards of Health and of City Boards of Health, and are fully indorsed by the State Board of Health of Rhode Island.

THE TREATMENT OF THE DROWNED.



TWO THINGS TO BE DONE:—RESTORE BREATHING; RESTORE
ANIMAL HEAT.

RULE 1.—*Remove all obstructions to breathing.* INSTANTLY loosen or cut apart all neck and waist bands; turn the patient on his face, with his head down hill; stand astride the hips with your face toward his head, and, locking your fingers together under his belly, raise the body as high as you can without lifting the forehead off the ground (Fig. 1), and give the body a smart jerk to remove mucus from the throat and water from the windpipe; hold the body suspended long enough to slowly count ONE, TWO, THREE, FOUR, FIVE,—repeating the jerk more gently two or three times.



RULE 2.—Place the patient face downward, and maintaining all the while your position astride the body, grasp the points of the shoulders by the clothing, or, if the body is naked, thrust your fingers into the armpits, clasping your thumbs over the points of the shoulders, and *raise the chest as high as you can* (Fig. 2) without lifting the head quite off the ground, and hold it long enough to *slowly* count ONE, TWO, THREE. Replace him on the ground, with his forehead on his flexed arm, the neck straightened out and the mouth and nose free. Place your elbows against your knees, and your hands upon the sides of his chest (Fig. 3) *over the lower ribs, and press downward and inward with increasing force* long enough to slowly count ONE, TWO. Then suddenly let go, grasp the shoulders as before and raise the chest (Fig. 2); then press upon the ribs, &c. (Fig. 3). These alternate movements should be repeated 10 to 15 times a minute for an hour at least, unless breathing is restored sooner. Use the same regularity as in natural breathing.



RULE 3.—After breathing has commenced, RESTORE THE ANIMAL HEAT. Wrap him in warm blankets, apply bottles of hot water, hot bricks, or anything to restore heat. *Warm the head nearly as fast as the body, lest convulsions come on.* Rubbing the body with warm cloths or the hand, and slapping the fleshy parts may assist to restore warmth and the breathing also. If the patient can SURELY swallow, give hot coffee, tea, milk, or a little hot sling. Give spirits sparingly, lest they produce depression. Place the patient in a warm bed, and give him plenty of fresh air; keep him quiet.

BEWARE!

AVOID DELAY. A MOMENT may turn the scale for life or death. Dry ground, shelter, warmth, stimulants, etc., at this moment are nothing,—ARTIFICIAL BREATHING IS EVERYTHING,—is the ONE REMEDY,—all others are secondary.

B E P R O M P T .

Do not stop to remove wet clothing before efforts are made to restore breathing. Precious time is wasted, and the patient may be fatally chilled by exposure of the naked body, even in summer. Give all your attention and effort to restore breathing by forcing air into, and out of, the lungs. If the breathing has just ceased, a smart slap on the face or a vigorous twist of the hair will sometimes start it again, and may be tried incidentally, as may, also, pressing the finger upon the root of the tongue.

Before natural breathing is fully restored, do not let the patient lie on his back unless some person holds the tongue forward. The tongue by falling back may close the windpipe and cause fatal choking.

If several persons are present, one may hold the head steady, keeping the neck nearly straight; others may remove wet clothing replacing at once clothing which is dry and warm; they may also chafe the limbs, and thus promote the circulation.

Prevent friends from crowding around the patient and excluding fresh air; also from trying to give stimulants before the patient can swallow. The first causes suffocation; the second fatal choking.

DO NOT GIVE UP TOO SOON: You are working for life. Any time within two hours you may be on the very threshold of success without there being any sign of it.

In suffocation by smoke or any poisonous gas, as also by hanging, proceed the same as for drowning, omitting effort to expel water, etc., from windpipe.

In suspended breathing from effects of chloroform, hydrate of chloride, etc., proceed by Rule 2, taking especial pains to keep the head very low, and preventing closure of the windpipe by the tongue falling back. Grasp the tongue between the forefinger and thumb. draw forward and hold.

PERSISTENCE IN EFFORTS TO RESCUSITATE THE DROWNED.

Dr. R. C. Kedzie, President of the Michigan State Board of Health, says, in relation to the foregoing circular, and in urgent persistence of efforts to resuscitate the drowned: "This bulletin has been widely distributed by this Board and it has been republished by many papers in our State. It has been adopted by other State Boards of Health and by city Boards of Health. It has thus secured a wide dissemination in our country. How much good has thereby been secured, it is impossible for me to state; but I have good reason to fear that *life is often sacrificed because energetic efforts at resuscitation are abandoned too soon*. I desire once more to urge upon the public *the duty of persistent efforts to resuscitate the drowned* and to repeat with emphasis one direction of the bulletin: 'DO NOT GIVE UP TOO SOON; *you are working for life. Any time within two hours you may be on the very threshold of success without there being any sign of it.*'"

"The efforts which are successful in restoring a human being to life certainly are not useless, and it is wicked to refuse or neglect to make such efforts unless the absolute certainty of death is established. It is not enough to say that the person *appears* to be dead. Persons who gave no signs of life for a long time after being taken out of the water have yet been brought to life by appropriate efforts. I most earnestly protest against treating the drowned as dead merely because they appear lifeless. I am fully persuaded that many such persons die because no adequate efforts are made for their recovery. Persons may swoon and for the time appear to be dead, but we do not assume that they are dead and leave them to their fate, but make energetic efforts to restore consciousness. No more should we assume the fact of death in the drowned, but should make like efforts to restore them to life."

HOW NOT TO DROWN.

"How to drown is an art that seems to be well understood and frequently practiced the world over. How not to drown is an art not so well understood, and requires some notice at the hands of this Board.

Drowning could be prevented if we could secure either of the following conditions: 1st, that everybody should know how to swim; 2d,

that nobody should ever go into the water. But as we cannot secure either of these conditions in the present order of things, we turn our attention to some means of reducing these accidents to their minimum of danger.

“Much good advice is often thrown away upon persons who find themselves suddenly thrown into the water: “keep cool;” “do not lose your presence of mind,” etc. The conditions are very favorable to follow the first advice in a literal sense, for the water itself will assist one to get cool and to keep so indefinitely; but when a person is suddenly compelled to face death in an unexpected form, the advice to “preserve your presence of mind” is usually driven out of the mind by overwhelming terror, and the person too often becomes *absent minded* in an awfully literal sense of the word.”

“The solids and liquids of the body are all heavier than water, but the living body on account of the air in lungs, stomach, and bowels, is slightly lighter than water; and so long as these cavities remain filled with air, the body will float in water, and a small part of the body can be kept above the water. While it is true that so long as the lungs, etc., are filled with air, the body is lighter than water, the difference in specific gravity is small, and only a small part of the body will float above water. What part will be above water depends upon the relative position of other parts of the body; if the legs are flexed and the arms thrown in front of the body, the centre of gravity is in the anterior portion of the body, and the top of the shoulders and back of the head only will be above water: the face being under the water, respiration will be impossible under such circumstances. But if the legs are straightened out and the arms thrown behind the body, the face will be brought above the water. In the attempt to float, therefore, *the legs should be straightened out, the head thrown back, and the arms held behind the body*: the face will then float above the water so long as this position is maintained. If one part of the body is thrown out of the water, a corresponding amount of the body will be submerged; if the arms are held out of the water, the head will go under. I remember the case of a boy who thought he would greatly increase his power to swim by tying an inflated bladder to each foot, but when he entered the water he came near drowning, because his feet were kept out of the water but his head under water: and he soon became practically convinced that it was important that his head rather than his heels should be in air.”

“If the mouth and nose is kept above water, respiration may go on without interruption, and life may be sustained indefinitely under such

circumstances. This may be secured in still water by merely floating with the face upward, every other part of the body being kept constantly under water. But with very little exertion a person may do more than keep his nose above water, even if he is ignorant of the art of swimming. I have seen persons "tread water" by making the same movements with the legs as in walking up stairs, and thus keep the entire head out of water for a long time. If a person will add to this, certain corresponding movements of the hands—in fact, *make the same movements of both arms and legs that he would in climbing a vertical ladder*, but without lifting his arms out of the water and without closing his hands in the downward movement of the arm, he may keep his head out of the water even when the waves are running high, and may keep from drowning for hours. Whenever a person finds himself in the water and in danger of drowning, let him assume as speedily as possible a vertical position, and at once begin the same movements as in climbing a vertical ladder—*let him climb for life*—and he will be surprised to find with what slight exertion he can keep his head above water; let him be satisfied with this, for he may exhaust himself in vainly attempting more."

The following communication by Dr. MacCormac of Belfast, to the Sanitary Board July 13, 1877, on "PADDLING THE WATER AS A MEANS OF AVERTING DROWNING," is inserted as imparting valuable information on this important subject:

"Already the fine season has been ushered in by a number of deaths, some of them occurring in our very midst, from drowning. The means of safety, or relative safety, which I have to point out, are so very simple, and as I believe, so effective, that I am lost in wonder that no one has thought proper to insist upon them, as in the following remarks it is my intention to do. Swimming, as ordinarily practiced, is not the most sufficing means for escaping the dangers of the water. It needs some instruction to be able to swim, and practice to be able to swim well. No doubt it is desirable to swim and to swim well. But the great majority of persons of both sexes do not know how to swim at all. Yet unless people can swim, and swim well,—and even then they are not always successful, when the emergency comes, in preserving life,—swimming is, I am persuaded, not so effective a preservative as is conjoint paddling and treading water. As a rule, subject to few exceptions, persons precipitated into the water do not swim without previously learning. But paddling with the hands and treading with the feet require no prior instruction, and in the great

majority of cases would save life. In swimming, the mouth is on a level with the water in the intervals of the strokes; in paddling, the head is well elevated; the individual is able to look about: he can deliberate as to what is best to be done, and he is much less liable to take water into the larynx or glottis, a casualty which, I am persuaded, causes the destruction of many. Without prejudice to the art of swimming, I would have children exercise in household tanks from the tenderest age, in the act of paddling and treading water, so as to impart the confidence which unreasoning dread tends to lessen or take away when one is suddenly immersed, in an unusual medium. The animal, the quadruped, begins to paddle at once when cast into water, but as man does not habitually employ the anterior limbs as organs of locomotion, reason must tell him that he may, if he pleases, employ them as organs of locomotion in the water, just as readily as any four-footed animal. To be sure a man has not the habit of using his hands and arms for locomotion, as the brute has, but otherwise how much more available is the paddle-shaped hand than a hoof or a paw. Again, the man with little or no instruction, by throwing his head well back, can float and rest at pleasure, a thing of which the brute has no conception whatever."

"Of course, a little preliminary habitude is desirable, but without any preliminary habitude or instruction whatever, there is nothing to hinder man, woman, and child, were they unable, in common parlance, to swim a stroke, from beating water with the hands and feet, just as the lower animals do, and so keep themselves afloat for a protracted period, a period that in a multitude of instances would be found sufficient to invite rescue and preserve life. The action of the feet down will sustain the body. The action of the hands down will do so; *à fortiori*, the action of both will prove yet more effective. I have tried myself; one alone, or both together,—nay, with a single hand only,—in bygone years, I am sure, hundreds of times. There is no occasion for fuss or bustle. The body, taken as a whole, is actually lighter than water, bulk for bulk, and a very moderate amount of paddling with feet and hands, will be found perfectly adequate to sustain and guide its movements. In fact, so long as the individual paddles, as I here direct, he cannot sink. A horse, or dog, or cow, or cat, or swine, when immersed in water, begin instantly to paddle, and that without any prior instruction or exercise whatever. Now, a man, or woman, or child has only to do as the inferior animal does, and he, she, or it will float necessarily and inevitably. The place being otherwise safe and boats at hand, boats' and ships' crews, a regiment of

soldiers, schools and the like might jump into deep water and paddle themselves into security without risk or failure. In this, as in many other things, man is too often unaware of his own immense capacities."

"Animals not habituated to the water, will often take to it spontaneously, or, if cast into it, sustain themselves for indefinite periods. A horse, during disembarkation in Portugal, fell into the sea and paddled about the harbor for a matter of six hours before it was secured. Washed or thrown overboard, the lower animals have been known to float for a long time. I knew of a mule, which, having been washed overboard in the Bay of Biscay, paddled itself ashore, and then crossed the country a couple of hundred miles to its previous quarters. The staff-surgeon in charge told me that, after leaving the Peninsula, the horses of the troop had to be thrown overboard in order to lighten the ship in a gale. The poor things, when they found themselves abandoned, faced around, and, so long as the ship commanded a view, were seen to battle with the wrack and wash for miles. A man on the coast of Lincolnshire, mounted on a gray mare or other horse, used to swim seaward to vessels in distress, and thus rescued many lives. Recently, nigh Brooklyn, N. Y., a dog took the water and paddled, it is said, forty miles in search of his master. Dogs often gain the shore when ships and their crews have been lost. Some years ago a dog landed at the Cape of Good Hope, with a letter in his mouth. The vessel to which he belonged had gone down with all hands; but if the men had paddled as the dog paddled, all their lives might have been preserved. Indeed, I know for certain that formerly it was the practice at the Cape for men to paddle out, it was termed "treading water," and bear communications to and from vessels in the offing, where no boat could live. It was, and I believe is still, the case at Madras, similarly. Natives at the island of Ioanna, in the Mozambique Channel, treading water, come out, bearing fruit on their heads to the vessels, miles distant. The young people in the islands of the Pacific, breast the gigantic breakers out of mere sport. The Indians of the Upper Missouri traverse the impetuous current, invariably paddling and treading water."

"Short instructions for paddling and treading water, ought to be posted up in all schools, barracks, and bathing places; wherever, in short, people have to do with the sea or with masses of water. It should be shown how easy it is, with a little well-directed effort, to preserve life, and how the yearly and calamitous destruction which besets our shores might, now, and happily for all time to come, be effectively stayed."

One precaution is necessary for a person who is paddling and treading water, to avoid strangling: when cold water is suddenly dashed into the face, an automatic or involuntary inspiratory effort or "catching the breath" is caused, and if the face at the instant is covered with water, strangulation from drawing water into the lungs is the result. When waves are dashing in his face, the person must guard himself against this spasmodic inspiration by holding his breath at such times, or he may even grasp his nose and close his mouth with one hand and thus prevent the possibility of strangulation.

HYGIENE IN THE PUBLIC SCHOOLS.

BY

GEORGE W. JENCKES, M. D.,

OF WOONSOCKET,

MEMBER OF THE

STATE BOARD OF HEALTH.

The following paper is a part of an Address by Dr. G. W. Jenckes
at the dedication of the Woonsocket High School.

HYGIENE IN THE PUBLIC SCHOOLS.

We ought to realize that true education does not consist merely in the acquisition of knowledge, the crowding of the memory with facts, but in developing all the powers of body and mind equally and harmoniously, and strengthening them by vigorous exercise. In pleading for the best education possible for us to obtain through the means at our command, and in protesting that the sharpening of the mental perceptions is but a small part of such education, what I shall say may possibly "smack somewhat of the shop."

It is not beyond the province of one who has given some attention to the study of individual and public health, to question somewhat the routine of school life and education. It is too much the fashion to lay great stress upon the mere intellectual processes involved in the pursuit of a well arranged course of study, which, as a means of mental discipline, may be all well enough, but which fails to be of practical benefit in the after affairs of life in a large proportion of scholars. We establish a curriculum of studies that shall fit for some special vocation in life; we teach something of the customs of communities and the regulations that prevail in business, but we do far too little toward imparting a true knowledge of physical existence. Physical education should go hand in hand with mental education. Health is a part of the higher culture, for body and mind are practically inseparable, and we should know nothing of the workings of the sound mind, were not the bodily senses in healthy condition to provide for the mental needs.

Health stands behind the accomplishment of all great success. It was not an army of invalids that marched with Sherman to the Sea, and broke the back of the rebellion with the force of a mighty blow.

The vigor and hardihood of able bodied soldiers and the supreme energy of an educated will in the commander, were equal, if not superior, agents to the musket and cannon in securing that triumph.

And so it is in every sphere of life. The application of practical force alone can make actual accomplishments of what would otherwise remain the dreams or hopes of a weaker will. Our education tends too much to create wants and expectations beyond our power to realize. Let me quote one who has spoken thoughtfully upon this subject: "Our young men know how to spend more money than they can earn, and our young women too often feed their ambition upon romantic fancies, and fill their stomachs with enfeebling trash! They dream of fortunes and palaces, and do not know how to make a shirt or a loaf of bread, to nurse an invalid or tend a baby, to train a child or rule a household; and sometimes even they crave the jewels and orange blossoms of the bride, while they repudiate the duties of the wife and the destinies of the mother. And the race is in danger of dying out in some quarters because of this repudiation of the queenly dignity and fidelity of the sex." What we need, then, is a careful and systematic education of all the powers of the body and mind, so that while the mental perceptions are sharpened, and the moral attributes cultivated, the physical system shall be placed and kept in such relations to external influences as shall establish the best possible degree of health. There is much wisdom in the old nursery rhyme,

"Early to bed and early to rise,
Makes a man healthy, wealthy and wise,"

in that it gives health the precedence, leaving wealth and wisdom to follow if they may. The saying that "wisdom and virtue cease where dyspepsia begins," is but an extravagant expression of the same truth. The primary fact to be recognized is, that all our education comes through the senses, and the more healthily and wisely they are open to the truths and forces of the universe, the more active and the stronger will be the mental operations resulting. Health begets force, and force applied to knowledge, makes it a power. It is said that "Cæsar was a better speaker and writer because he had been a soldier, and could put into his pen, in his commentaries, the point and fire he had won by his sword in his campaigns; and that David was a greater poet because the hand that touched the lyre, had grappled with the lion and the bear, and had hit the Philistine upon the head with a sling, as unerring as the words that have reached the heart of the race, and will reach it evermore." Our very constitution as organic bodies,

determines our duty; all the health and strength of which we are capable are demanded by our possible attainments. Not only to establish this state of health, but to preserve it, is the part of Hygienic study.

Between a state of perfect health and actual disease, when professional aid is sought, there is a wide field, occupied by thousands who generate just enough of vital energy to enable them to maintain a sort of passable existence, but not enough to enable them to mingle in the harder conflicts of life. To remedy this state of things, more of our thought and effort as public educators ought to be directed. According to the reports of many of our Educational Boards, it is the nervous system especially which suffers from our present methods of education. To say nothing of special diseases, such as myopia, chorea, &c., which are on the increase among school children, we have all of us seen something of the pernicious effects of this intellectual high pressure in some of the recent sad instances of cerebral disturbance in public life. Without doubt, a proper amount and well regulated course of study are among the best means of strengthening both mental and bodily powers; and equally, without doubt, much of our present method of education by the amount and kind of work done, by illy selected hours of study, by improperly divided seasons of school work, where a short vacation follows each of two or three terms, and then a long vacation of two or three months of aimless idleness of body and mind, and by other means, such as illy lighted, illy heated and illy ventilated school-rooms, bad seats and bad type in text-books, by useless drills and cramming for special examinations, by rank lists, and by so much routine teaching from text-books rather than the cultivation of the original powers of observation in the pupil, result in an indescribable sense of fatigue at the end of the day's work, and prove the severest possible strain upon the child's natural powers. I speak of these things, Mr. Superintendent and friends, because I wish to urge that the study of Hygiene, practically the most useful science, should be made a marked feature in every grade of education. While the rudimentary truths should be inculcated in every household, the grand principles of the science should be thoroughly taught in every school, from the highest, where the teachers are fitted for their labors, to the lowest, where, either through errors of judgment or an almost unpardonable degree of ignorance, the first steps are taken in devitalizing so much child-force. For instance, how much time have we all seen devoted by teachers in trying to prevent certain motions and changes of position, that had become actual physiological necessities by reason of too long restraint.

Other misconceptions which I cannot particularize, as to the needs, habits and peculiarities of scholars, extend through the whole course. I can only say that if there were a better knowledge of Hygiene, there would be less negligence in the supervision of those conditions necessary to a continuance of intellectual as well as moral virtue in school children, and less ignorance on the part of parents and teachers of the existence of that nameless vice which saps the very foundations of nervous energy.

Properly taught, the study of Hygiene, involving as it does elementary instruction in chemistry and physics, as well as physiology, affords as good means of mental discipline as any other course of academic study, since its principles are the purely logical deductions of demonstrable facts. And beside the discipline thus afforded, the study of this science would have the further advantage of offering practical benefits to every member of the community. The amount and frequency of habitual crime are largely traceable to physical debasement. A knowledge, then, of the philosophy of health and life, would constitute one of the best legacies to posterity by informing those who are to give birth to future generations how best to fulfill their parental obligations, and to transmit to their offspring an unimpaired inheritance of health.

Mr. Superintendent, in committing to your special care the interests of education that shall centre in this building, I would express the hope that the instruction to be here imparted, shall result in giving to this community and State, able-bodied and able-minded citizens. Success in life, whether with the student, the artisan or laborer, can be achieved only by hard work, and hard work pre-supposes vigor of body, power of endurance and an educated will. These are the foundation stones; "other foundation can no man lay than that is laid."

WALL PAPERS,

THE DANGER TO HEALTH ARISING THEREFROM, AND
HOW PREVENTED.

POISONOUS CARDS, LABELS, ETC.

BY

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CHAIRMAN OF COMMITTEE ON EXPLOSIONS AND CHEMICALS DAN-
GEROUS TO LIFE AND HEALTH.

WALL PAPERS,

THE DANGER TO HEALTH ARISING THEREFROM, AND HOW PREVENTED.

POISONOUS CARDS, LABELS, ETC.

Some few years since the discovery was made that arsenic existed to a considerable extent in various wall papers offered for sale throughout the country, and many diseases whose origin had seemed mysterious were readily accounted for when the presence of this active poison became known.

For a while the public were cautious in buying, and green papers were a drug in the market.

The subject, however, soon lost its hold upon public attention, and finally disappeared out of sight and out of mind.

Arsenic, however, was still employed in the manufacture of wall papers, entering more or less into those of other colors and tints than the well-known green. Indeed, it is still an open question whether this well-known green, the very color of which admitted its baseness, was not less hurtful than is the modern fashionable wall papers in whose delicate tint and subdued tone may lurk this deadly poison all the more dangerous to life and health, because unsuspected or undiscovered.

All wall papers are not dangerous from this source, and there are undoubtedly green papers in whose pigment no poison is combined, but if one "must" purchase green wall paper let him first cause them to be tested for arsenic before exposing his household to possible sickness and death.

Although arsenic is the most dangerous element to be looked for in wall papers, it is by no means the only source of probable injury to health.

Every one is fully aware how easily the colors are rubbed off from the surface of many papers; how oftentimes the heaviest, thickest papers wear the shortest time, and how frequently the ordinary dusting of the room detaches the coloring material from the walls.

If this coloring matter thus detached was promptly removed from the room no injury would result save that to the appearance of the walls from constant loss, or apparent fading of the colors of the paper. But this coloring matter remains frequently as an impalpable dust in the room, to be breathed by those in the apartment, settling upon the furniture, hangings and carpet, and disturbed and put in motion, but *not* removed, whenever the room is dusted or swept.

Another source of possible injury to health exists in the decomposition of the sizing and paste used in, and upon, the paper hangings themselves. If arsenic should be present in the paper, it is a grave question whether this decomposition is not rendered exceedingly dangerous to health by the chemical combination thus formed, by the decomposition of the starch and gums with the arsenic, or even with other substances entering into the coloring matter upon the paper.

It is certainly worthy of passing consideration that in all papered rooms, a constant decomposition of the starch and gums is taking place, and persons occupying such rooms are living in an atmosphere more or less contaminated by the decomposition continually going on.

In proportion as houses are kept closed and darkened, does the danger from this cause increase, and the musty odor of a papered room which has been closed and kept darkened for some time, is sufficient evidence of the danger to be apprehended.

Three sources of danger to health, therefore, may be looked for in wall papers.

- I. From those known to contain arsenic.
- II. From those whose coloring matter is easily detached.
- III. From the decomposition of the size and paste employed in the manufacture of the paper, and hanging the same upon the walls.

The danger from these sources may be averted,—

- I. By submitting all doubtful or suspected papers to the tests for arsenic, before putting the same upon the walls.

II. By selecting such papers as are known to contain no arsenic, and where colors are not easily removed either by rubbing with a dry cloth or the hand itself.

III. By removing all the old paper, and thoroughly washing off with hot water, all the paste from the walls before repapering.

The simplest test for arsenic, and one most available for the public is given by R. C. Kedzie, M. D., Chairman of Poisons, &c., Michigan State Board of Health, 1873, and is as follows:

“If the color is a bright grass green it may be safely rejected at once. If a little ammonia poured upon the paper discharges the green color, or produces such a change in the color as indicates the removal of green it should be rejected.

“The two arsenical greens, Scheeles Green and Schweinpath Green, are readily soluble in ammonia water—the water acquiring a bluish tint. Other compounds of copper are also soluble in ammonia water, but they are not much used in paper hangings. If you wish to identify the arsenic, drench a piece of the paper in a little ammonia water, pour off the clear water and drop into this a crystal of nitrate of silver, if a yellow precipitate forms around the crystal it indicates arsenic.”

POISONOUS CARDS, LABELS, TAGS, ETC.

There exists at the present time another prolific source of danger from arsenic, particularly to young children. And that source is found in the “green” business or advertising cards, distributed indiscriminately upon the streets: in the green tickets used for entertainments, theatre checks, &c., and in labels, tags and shop cards. In fact the danger of poisoning from these cannot be estimated.

Every child should be prohibited from having any “green” card or ticket in its possession, and it should be the duty of every parent to impress upon his or her child or children, the dangers likely to arise from handling such cards, &c., especially when, as is often the case, the child’s hand is moist, and the poison is thereby easily detached from the surface of the pasteboard and communicated to the person handling it. An advertising card was recently shown the writer, probably one of thousands printed, and given away daily upon the streets, whose very color proclaimed its dangerous character, and the children of the family were forbidden ever to keep such a card, or ever to receive it from any one upon the street.

The estimable report of Dr. Draper, "On the evil effects of the use of arsenic in certain green colors," in the third annual report of the Massachusetts State Board of Health, and the article on "Poisonous Paper," by Dr. Kedzie, Michigan State Board of Health, for 1873, will well repay a careful reading by every one interested in the promotion of the public health.

It is impossible, in the short space of an article like the preceding one, to impress upon the general public the importance of the subject matter contained therein.

It is, however, to be hoped that such attention may be given to it, that the evils arising from ignorance of the matter may not be realized in this State, as they have been in numerous instances, not only in this country but in the countries of the Old World.

THE PREVENTION OF
KEROSENE ACCIDENTS.

BY

JOHN H. APPLETON

OF PROVIDENCE.

PROFESSOR OF CHEMISTRY IN BROWN UNIVERSITY.

THE PREVENTION OF KEROSENE ACCIDENTS.

Every one knows that kerosene accidents are constantly occurring. Yet I should think that the oil had been used long enough and widely enough for people to have learned how to use it with safety.

I do not think it worth while to explain here the scientific conditions which precede kerosene accidents; I do not think it desirable to discuss here the question whether such accidents are generally due to a mere *blazing up of a quantity of oil, carelessly spilled and set on fire*, or whether they are often caused (as is commonly believed) by *explosions of lamps*. A discussion of these or of other similar questions would probably prove of little service to those who are most likely to become the suffering and dying victims of bad or of misused oil.

I prefer that my remarks shall take the form of an easily understood warning; for I believe that such a warning is most likely to conduce to the protection of consumers of oil.

Now there are three principal conditions attending the use of kerosene oil: these conditions are *first*, the purposes for which the oil is used, *second*, the kind or quality of oil used, *third*, the character of the people using the oil.

FIRST CONDITION.—Kerosene oil is used in two well-known ways, namely: *for a wrong use*, as for kindling fires; *for a right use*, in lamps for lighting.

SECOND CONDITION.—Kerosene oil as offered for sale, is of two kinds, namely: *unsafe* oil, and *safe* oil.

THIRD CONDITION.—Kerosene oil is used by two classes of persons, namely: the careless and ignorant, and the careful and intelligent.

The mere statement of these conditions at once suggests three rules.

FIRST RULE.

No person ought to use any kind of kerosene oil, good or bad, for kindling fires. When so used, the oil is liable to instantly burst into an enormous blaze which, streaming out of the stove, at once envelops any one near it in a sheet of flame that may cost the user his life.

SECOND RULE.

No person ought to use unsafe oil. Every careful person will at once admit the force of this proposition. The question naturally arises, "how may we avoid unsafe oil?" I believe that the simplest answer is, "buy only from the most respectable dealers, and take from them only the oil of well-known respectable manufacturers."

It is true that our statutes make provisions looking toward the *complete exclusion of unsafe oils from the State*. But statutes may fail to produce their intended effects. Inspectors may not do their duty. Bad oil may be offered for sale. But there are several large firms engaged in making oil that is uniformly of high test, and safe.

Any honest and respectable dealer can at once mention the names of manufacturers whose oils are unquestionably safe.

THIRD RULE.

Ignorant and careless persons ought not to be allowed to use kerosene oil at all. They should be required by their employers to use candles, or other extremely safe light.

These rules have so narrowed the subject that we may readily conclude that no anxiety need be felt when

(*first,*) intelligent and careful persons,

(*secondly,*) use safe oil,

(*thirdly,*) in suitable lamps for illumination.

But the statement does not appear to be complete until we enumerate some of the marks which distinguish—in this matter—careful persons from careless ones.

CARELESS PEOPLE.

Careless people neglect all day-work on the lamp; they leave it to be done at the worst time, that is, after night-fall.

If the careless person's lamp gets out of order or low in oil, he is tempted to keep it lighted while refilling—so he is liable to be burned to death in the operation.

I leave these plain remarks to the common sense of the reader, feeling certain that, after all, it is common sense that must be the guide in this matter as in most of the business of life.

CAREFUL PEOPLE.

Careful people have more than one lamp; they buy oil in the day-time; they clean the lamps by day-light, filling them and trimming the wicks.

If one of the careful person's lamps gets out of order, *he uses the other*, and so he can fill, or otherwise adjust the other on the next day during the safer hours of day-light.

K E R O S E N E .

BY

H. H. BURRINGTON,

OF PROVIDENCE,

CHEMIST AND DRUGGIST.

KEROSENE.

In compliance with the request of Hon. Elisha Dyer, Jr., Committee of the State Board of Health on *Explosives, &c.*, I respectfully present the following statement of facts in relation to kerosene; and the request comes in good time, as there are matters of importance in connection with the kerosene oil business in this city that need prompt and decisive action:

To make the matter as intelligible as the nature of the case will admit, I have thought it best to commence at the beginning.

As petroleum and its products have become of the greatest utility to the people of this, as well as of other countries, and as the whole business of its distillation, manufacture, &c., has become so systematized and perfected that there is no reason and no excuse why any kerosene oil, intended for illuminating purposes, should be allowed to be placed in the market, or permitted to be sold, that is not safe, or that will not stand a legal fire test, duly inspected, and the package in which it is contained suitably branded by a competent person appointed for that purpose. In the early days of its discovery, many accidents occurred from a want of knowledge of its properties, which might have been excusable, at that time, but are not so now.

The matter of unsafe kerosene oil, sold in this city for illuminating purposes, was first brought to the notice of the City Council, in April, 1866, and was published in the *Daily Journal*, at the time, as follows:

A STARTLING FACT

was brought to the attention of the Common Council, at its last meeting, by Mr. H. H. Burrington, who introduced the draft of an

ordinance, relative to inflammable and explosive articles, and took occasion to comment upon the dangerous character of much of the kerosene now sold in our city, for illuminating purposes. Mr. Burrington has tested twenty-one samples, and finds much of it as unsafe as gunpowder. Only five of the samples were safe to use as a burning fluid, and they were not entirely free from objection.

In introducing his ordinance, Mr. Burrington remarked: The great consumption of kerosene oil in cities where gas, so called, is used, as well as in villages where gas is not used, loudly calls for a few remarks upon its properties, the benefits, and disadvantages, the safety, and danger attending its use.

In the manufacture of kerosene, the first running of the oil is called benzine, kerosoline, &c., &c. Now benzine has a peculiar property, in which we all are deeply interested: it is that of explosion, and it is the presence of this fluid in kerosene proper which renders the oil explosive. Exclude from the kerosene this explosive part of the fluid—this benzine—and we have an oil as harmless as that of the spermaceti whale, with a far greater illuminating power.

But it unfortunately happens that this explosive product—the benzine—is in large proportion to the whole distillation, and in consequence, a part of it is suffered to remain in, or is intentionally mixed with the kerosene. As is the proportion of benzine to the kerosene, so is the power and danger of the explosion. That some of the kerosene in the market is carefully and properly prepared, and therefore perfectly safe in its use, is abundantly and satisfactorily proved; while it is a fact lamentably ascertained by almost daily experience, that much of the kerosene sold among us, contains too large a proportion of the explosive material. Now, the first question that naturally arises is: how are we to know what oil is safe to burn, and what is not.

It is well known that heat increases the explosive powers of kerosene, by converting the benzine, or a portion of it, into vapor, which instantly ignites on coming in contact with a flame; hence the explosion of a kerosene lamp when it is extinguished by blowing down the glass chimney upon the flame. If too much benzine be present, a little heat is enough to raise sufficient vapor to be dangerous.

By decisive experiments, it is known that kerosene that will bear heat of 120° F. is safe. No danger attends it, if used in a properly constructed lamp, and the heat to which kerosene is exposed, in all ordinary occasions does not equal the temperature named. Kerosene that will not stand the test of 100° F. should be looked upon as so much gunpowder.

In consideration of the above facts, I have been induced to test the quality of twenty-one samples of kerosene now in market, with a kerosene oil fire tester, and with the following result:

One sample exploded at 78° F.; one at 84° F.; one at 86°; three at 88°; two at 90°; two at 92°; one at 94°; two at 98°; one at 100°; one at 102°; one at 104°; one at 106°; one at 108°; two at 110°, and one at 114° F. Thus it will be seen that eight only out of the twenty-one samples stood the test of 100° F., and only five out of the twenty-one are sufficiently free from explosive matters to be safe, and that ought to be allowed under any circumstances whatever, to be kept in market.

In conclusion, let me assure you, that one barrel of the explosive compound is positively more dangerous to property and life than one hundred barrels of the preparation that will stand the test of 110° Fahrenheit.

The result of the above report was the adoption of an ordinance by the City Council, providing that no kerosene oil should be sold in the city that would not stand the fire test of 110° F., created the office of Inspector of Kerosene, and defined his duties, and also provided how petroleum oil, or any of its products, should be stored.

The ordinance gave general satisfaction, and the result was a decrease in the number of accidents occurring from the use of poor kerosene, and so continued for several years.

In May, 1877, the following statement appeared in the *Daily Journal*:

“The alarm of fire, Saturday night was caused by the explosion of a kerosene lamp. We had written mysterious explosion, but we can hardly say that any kerosene explosions in our city are mysterious, in view of the facts set forth in Prof. Appleton’s report on ten samples of kerosene taken from branded casks and submitted to his chemical inspection.

“A feeling of insecurity must pervade the whole community, for the peril is not confined to those who use explosive fluid, unless a rigid enforcement of the law regulating the inspection of kerosene can restore confidence in the city tests and brands.”

The following are the tests of the ten samples referred to:

<i>Marks.</i>		<i>Burning Point.</i>	<i>Marks on Barrels.</i>
No.	1.....	100°.....	120°
"	2.....	90°.....	122°
"	3.....	106°.....	122
"	4.....	94.....	120°
"	5.....	100°.....	None.
"	6.....	104.....	120°
"	7.....	88°.....	120°
"	8.....	104°.....	125°
"	9.....	104°.....	122°
"	10.....	108°.....	122°

It will be observed by the above report, that the oil tested, is nearly as low test as that tested twelve years ago, when there was no Inspection of Kerosene.

At a recent meeting of the "Providence Franklin Society," I read a paper upon "The Explosiveness of Kerosene Oils." As portions of it are applicable in this connection, I reproduce it here.

In the early days of the discovery of kerosene oil, it was distilled from bituminous coal, and so much pains was taken in its manufacture, that it was but seldom that any accident occurred from its use. It was only after the discovery of the immense quantities of petroleum oil in Pennsylvania that its cheapening was practised.

And during the past few years, the competition in price has become so great, that its usefulness has almost been exceeded by its dangerous qualities. The dealer not being satisfied with it as it comes from the manufacturer, let it be ever so poor, still further reduces its quality, by adding naphtha to such an extent, that it is unsafe and unfit to use for illuminating purposes. It is true that this mixed oil will not always explode, and can be burned in lamps in comparative safety, under certain conditions. When the lamp is full, no vapor can be evolved, and if a match were thrust into the oil, it would be immediately extinguished. Not so, however, if the lamp is put in a warm place and is only half full of oil. Then, as the oil is consumed, its place is filled with an invisible vapor, which will instantly explode when it comes in contact with the flame; or if there should be any defect in the top of the lamp, the vapor would escape, and there would be an explosion, or the vapor might be forced in contact with the flame in the act of blowing down the chimney, a practice that is extremely hazardous, and should never be done, especially when oils of a low grade are used.

Almost all of the northern states have passed laws forbidding the sale of kerosene that will explode at a lower temperature than 110° F. Experience, however, has shown that the explosive point should have been placed at 125° F., instead. Iowa has recently passed a law, compelling 150° F. as the fire test, and all dealers who sell oil of a lower test, are liable to both fine and imprisonment.

It will usually be found that when kerosene lamp explosions take place, as they often do at this season of the year, the lamp was in a very warm place, and the oil used of a lower test than 110° F. About a year ago I procured some half-dozen samples of kerosene oil from the stores where it was for sale, and found that none of them stood a higher test than 100° F.

This season I have done the same thing, and find the kerosene offered for sale, 10° F. poorer than that sold last year, none of the samples standing a higher fire test than 90° F.

The facts to be deduced from the reports and statements above mentioned are, that there are thousands of barrels of kerosene sold in this State every year, from 10° to 25° below the lawful fire test, to the great danger of loss of life and property.

Kerosene oil is a mixture of several elements, which under certain conditions, is of a highly dangerous character, and its natural qualities and phases can best be understood by those who are fully conversant with its chemical properties; and so much depends upon the reliability of its fire tests, that the office of inspector of kerosene should be filled by a practical chemist, or by those who are fully competent to perform its duties.

The State laws, in relation to the inspection and sale of kerosene, need revision in some particulars, which it is hoped will be done at the next meeting of the General Assembly.

Very respectfully yours,

H. H. BURRINGTON.

Chemist and Druggist.

PROVIDENCE, Jan. 1, 1879.

MEDICAL TOPOGRAPHY
OF RHODE ISLAND.

BY

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The following paper is a modification of a portion of a report, made to the American Medical Association, as a member of a Special Committee on Medical Topography.

MEDICAL TOPOGRAPHY

OF THE STATE OF RHODE ISLAND, WITH A FEW SUGGESTIVE STATISTICS.

The State of Rhode Island and Providence Plantations has the smallest territory and the longest name of any of the States of the American Union. In the report on the census of the United States, its area is said to be 1,306 square miles. This, however, is greater than the actual extent of the land of the State, or the aggregate area of its several townships, and must be an estimate including a considerable portion of the waters inclosed within its boundaries. The actual area of the towns of the State; according to the most authentic maps, amounts to not much more than 1,050 square miles. Before the exchange of territory with Massachusetts, in 1862, the area of this State was 1,046.4 square miles. That exchange increased somewhat the territorial extent of Rhode Island. The forty-second degree of north latitude passes through this State, very near its north boundary line.

The most prominent geographical feature of the State* is Narragansett Bay, about thirty miles long, and twelve miles wide at its broadest part. The principal mainland is a tract measuring more than forty miles from north to south, and twenty from east to west, and bounded on the west by Connecticut. The greater part of this tract is bounded on the east by Narragansett Bay, and its tributary, Blackstone or Pawtucket river; the northeast corner of it, being the town of Cumberland, is east of that river. A second, much smaller division of the State, lies on the east of the Bay, and of the navigable part of Pawtucket river; it is from two to four miles wide, and is divided into two parts by Mount Hope Bay, which enters the Narragansett from the

* To follow geographical and geological descriptions, see map of Rhode Island, preceding the title page.

northeast. Thirdly, the islands form a very important division of the State. The island which gives name to the State fills up a large part of the width of Narragansett Bay in its lower half. There are other inhabited islands in the Bay; and Block Island, more than ten miles off shore, in the Atlantic Ocean, is a well-peopled town.

The early settlements of the State were mostly on the islands and shores of the Bay, and at its head. All the important villages which grew up before cotton manufactures were introduced were near the water. We may defer, for the present, an account of Providence, which is at the head of the Bay. The other places have depended partly on commerce and fisheries for their support, and have not grown as rapidly as the rest of the State, with one or two exceptions. Their climate is tempered by the Bay open to the south, and by the Gulf Stream, and is more equable than that of more northerly parts of New England. Newport, the largest of these towns on the Bay, was an important seat of commerce before the Revolutionary War, and is now a summer resort of unsurpassed attractions; it is famous for its "delicious and cosmetic climate," modified by the direct breezes from the Atlantic Ocean. The part of Newport occupied by villas and hotels enjoys these advantages of air and situation to the full; but most of the residents of this old town live on the side toward the harbor, where the houses are quite crowded, and the air is more confined. The population of Newport is more than 10,000. The city has not been free from severe visitations of epidemic disease, scarlatina having been very fatal there in the winter of 1857-1858, and typhoid dysentery in the summer and autumn of 1863.

The western portion of the State is occupied by the granitic rocks, mostly gneiss, forming hills of moderate elevation, of which the general direction is from north to south. The whole tract of country from Western Connecticut to Narragansett Bay has this general character. In the western part of Rhode Island, the larger streams are altered in their course by draining eastwardly toward Narragansett Bay; except in the southern towns, where they run toward the southwest, parallel to the general trend of the coast, and empty into the Atlantic Ocean. Still, the small beginnings of these streams often show the influence of the prevailing north and south course of the hills. The gneiss of Western Rhode Island is continuous with that of Central Massachusetts. That portion of the State is generally blessed with plenty of good pure water.

This granite tract is not generally densely inhabited, the most populous parts being the manufacturing villages which line the streams

that furnish water-power. Some of these are not as favorably situated for health as the higher land between them. The houses of the operatives, which are in most villages owned by the proprietors of the factories, are too often built near the level of the streams, subject to the damp and mists of the low valley, the wells being fed more or less from the river-water, which contains organic matter from vegetable and other decomposition. In the hot and sickly season, these valleys are apt to be either sultry at night, or else the temperature falls very much and rapidly. We shall have occasion to give some details on this point, in speaking of dysentery, which appears every August and September in the lower lands of this western region of the State.

As we approach Narragansett Bay, a new geological character modifies the scenery and soil. A basin occupied by the coal-bearing rocks dips under the Bay, reaching a part of each side. The western boundary of this basin passes from near the northeast corner of the State, and runs in an irregular curve a few miles west from the shore of the Bay, till it meets that shore some twelve miles from the ocean. South of this point, the granitic rocks extend quite to the Bay, and indeed, encroach on the southwestern part of its largest islands. Near this western boundary of the basin are many marks of geological disturbance, dislocated strata, metamorphic rocks, and beds of iron and lime. On the east side, the granite reappears in the towns south and east of Mount Hope Bay, and at Mount Hope. This basin, as it enters the State from the northeast, is over fifteen miles wide, and narrows toward the south. The dip of the rocks in all the western part of the basin is toward the east, sometimes southeast, sometimes northeast, and sometimes with great variations in small space. East of Pawtucket river and of the most northerly part of the Bay, the strata still dip eastwardly, draining the soil, not toward the Bay, but toward ponds and small fresh-water rivers. North of Mount Hope, toward the town of Warren, the dip is northerly; in the towns south of Mount Hope Bay, and along the eastern shore of the island of Rhode Island, there is a westerly dip, being the side or wall of the basin. The main rocks of this formation are coarse and fine conglomerates, slates and shales, often containing vegetable impressions.

Some points in the topography of towns lying on the east side of the Bay and Pawtucket river, within the limits of this basin, ought not to be omitted here.

The town of Warren has a small area, and most of its inhabitants live in the village, which is situated on a rather low and level tract, having Warren river, half a mile wide, on the north of it, and a cove

emptying into that river, on the northeast of the village. The soil is underlaid by hard clay. The strata in the hill south of it dip toward this low land. At very high water, the marshes adjoining the village are liable to be overflowed. There is no barrier to shelter this village from the northeast winds coming over this broad expanse of water. The compact part of Bristol is south of the hill which divides the township from Warren; it is sheltered on the north and east, and open to the Bay toward the south. It has been shown by bills of mortality kept for several years, that deaths attributed to consumption are considerably more frequent in proportion to the population in Warren than in Bristol; while Bristol has suffered more from zymotic diseases, such as scarlatina and summer complaints. In a series of years the deaths from consumption were in Warren about twenty-three per cent. of all; in Bristol, about thirteen per cent. In the former place, about one in every 275 inhabitants died annually from consumption; in the latter, about one in 450. These results were published some years ago in the Second Registration Report of the State and in Reports since, very similar statistics are given. It is true that the vagueness in the use of terms throws a shadow of doubt over any such results; but in each town the causes of death were usually ascertained from physicians; in Warren the bills of mortality were kept by an eminent physician of that town; and we know no reason to suppose that any difference in the nomenclature of disease prevailed in the two places.

We have also some interesting testimony from Pawtucket, which we received in a letter from Dr. Sylvanus Clapp, a distinguished physician of that place. The village of Pawtucket lies on both sides of Pawtucket river, at the head of its navigable portion.

Dr. Clapp writes: "After a few years' observation, I became satisfied that consumption was much more prevalent on the east side of the river than on the west. Subsequent observation has clearly demonstrated the fact; there being a fraction over two deaths on the east to one on the west, in proportion to the population. This I gather from the records of the town, as well as my own.

"The Pawtucket or Blackstone river runs a little west of south; the land rising on each side of the river about eighty feet above the level of the water. The tides come up to the falls. The land rises more abruptly on the east than on the west side. As to geological formation, the conglomerate or grauwaacke, alternating with clay-slate, occurs abundantly in regular strata, which run north and south, and dip about 80° to the eastward. The dip of the rock is the same on both sides. All the springs on the west side run directly into the river,

while on the east side they run in a southerly direction to the river. The soil on the east side contains more clay, and springs are much more abundant. Then there is a large pond, situated at the edge of Seekonk Plain, and not more than half a mile from the river, directly east of the village; this, when full, must cover 25 or 30 acres. It is situated higher above tide-water than the greater portion of the village. The wells, for the most part, are but a few feet below the ground, the water coming near the surface in the spring of the year. Some of the cellars in the lower streets contain more or less water every spring.

These observations agree quite well with the general results of inquiries made by Dr. Henry I. Bowditch, of Boston, and presented in the discourse delivered by him before the Massachusetts Medical Society, in the year 1862. The following extracts show the drift of his views: "I believe that all towns, parts of towns, houses even, that *rest on damp, cold soils*, are by that very fact peculiarly liable to the prevalence of consumption. I believe that similar locations *near wet meadows, rivers, marshes, &c.*, though less subject to the law, are nevertheless in a lesser degree, promoters of consumption in the families resident thereupon."¹ He also shows a similar influence of north and east winds blowing over water.

In the western part of Providence city, and in a tract extending about ten miles south, and six miles north from it, the carboniferous rocks are overlaid by deposits of gravel and sand, with some layers of clay, forming a pretty level and not over-fertile region.

Over all these formations the "drift" common in all parts of New England is found, with its usual character of gravel and boulders.

There are no large alluvial tracts; and no very high hills, nor large rivers in Rhode Island. We doubt if any point in the State reaches a height of six hundred feet above the level of the sea. Still, the rivers have a considerable fall; in many parts they are narrow and rapid, affording excellent motive power. This fact has had a most important influence on the growth of population, the industry and social and sanitary condition of the State.

The soil is not fertile, compared with large regions which have now been brought into easy communication and competition with us. Still, it is probably more capable of yielding a profit to skilful husbandry, on an average, than the soil of Massachusetts. The northern towns were long ago celebrated for their orchards; the southern towns of the main land export great quantities of poultry; and the large islands con-

¹ Communications of Massachusetts Medical Society, vol. x. p. 122.

tain most beautiful tracts of farming land. But the agricultural industry of the State is far less important, in proportion to its population and wealth, than it was many years ago.

The city of Providence contains nearly forty per cent. of the entire population of the State. It is situated at the head of Narragansett Bay, Pawtucket river forming its eastern boundary. It was originally laid out between that river and Providence river, a mile or two farther west. But the city has grown toward the west, till now more than three-quarters of the population live west of Providence river. This river, with a broad cove, through which the tide ebbs and flows, divides the city into an eastern and western portion. The former lies mostly beneath and upon a ridge which rises by a steep ascent to a height of nearly 200 feet. It rests on stratified conglomerate (grauwacke), overlaid with gravel; the well water is generally abundant, cold, and clear; the uneven surface gives excellent opportunities for drainage. Some streets on this side of the river are low and shut in by higher land on all sides, and mostly inhabited by families not in the best sanitary conditions. On the west side, most of the residences are built on the plateau of gravel and sand already described; this was formally continued toward the river by sandy hills and low, wet land, which has now been reduced to a regular and convenient slope. There was formerly difficulty in obtaining good water here; but very good water is now abundantly supplied to this, and all other parts of the city, from the Pawtuxet, a river about six miles distant. A good deal of made land on this side is now covered with busy streets.

The higher parts of the city are generally occupied by the wealthier and more comfortably situated classes; the poor and laboring class, including a large part of the foreign-born live more on the outskirts and the lower land.

The City Registrar, in his annual report for 1859, mentions the following favorable circumstances in the topography of Providence:

“1. The very great inequalities of the soil within the limits of the city, giving easy and efficient drainage; the speedy removal of surface filth, and a free circulation of air. 2. The comparatively scattered location of the dwellings. 3. The numerous trees and gardens in most portions of the city. 4. The almost total absence of cellar tenements and underground population. 5. The absence of *large* tenement-houses, such as are found in other cities. 6. The absence of narrow courts and closed lanes. 7. The open space of tide-water through the centre of the city.”

The most complete, long-continued, and available meteorological records kept in the State are those of Professor Alexis Caswell, D. D., the observations being taken three times a day, with very slight interruptions for forty-five years, on College Hill, Providence.

Rev. Dr. Caswell having deceased January 8, 1877, no reliable records of meteorological changes for the years 1877-'78 are available.

The following tables were compiled by Dr. E. M. Snow, for the Registration Report for 1876, from observations made during that year, by Dr. Caswell:

TABLE I.

Showing the mean altitude and range of the Barometer, the prevailing winds, the mean relative humidity, the mean cloudiness of the sky, the number of days of rain or snow, and the quantity of rain and melted snow, for each month of the year 1876, and compared with the average for 45 years.

MONTHS.	Mean height of the Barometer reduced to 32° Fahrenheit, and to the Sea Level.	Range of Barometer.	NUMBER OF DAYS OF PREVAILING WIND.				Relative Humidity.	Mean Cloudiness of the Sky.	RAIN FALL.			
			North and East.	East and South.	South and West.	West and North.			Number of Days of Rain and Snow.	Rain and Melted Snow in Inches.	Compared with average for 45 years.	
										Monthly.	From January First.	
January.....	30.068	1.224	3	5	8	15	77.7	0.49	11	1.28	1.96—	1.96—
February.....	30.050	2.080	7	4	5	13	76.5	0.49	12	4.42	1.34+	0.62—
March.....	29.966	1.178	6	9	6	10	72.7	0.52	9	9.15	5.85+	5.23+
April.....	29.876	0.932	6	3	8	13	56.6	0.50	7	4.24	0.32+	5.55+
May.....	30.026	0.822	7	11	6	6	76.2	0.44	9	3.23	0.41—	5.14+
June.....	29.980	0.612	6	11	8	4	73.9	0.46	9	1.40	1.99—	3.15+
July.....	29.964	0.192	7	6	12	6	71.6	0.36	11	4.14	1.02+	4.17+
August.....	30.049	0.540	6	11	7	7	76.0	0.29	3	1.82	2.43—	1.74+
September.....	29.958	0.746	11	5	8	4	78.0	0.54	11	5.73	2.61+	4.35+
October.....	29.960	0.794	2	5	8	16	62.5	0.41	4	2.15	1.36—	2.99+
November.....	29.935	0.866	16	1	3	10	81.4	0.67	10	6.95	2.91+	5.90+
December.....	30.156	1.564	7	1	2	18	76.0	0.55	9	5.25	1.45+	7.35+
Whole Year.....	29.999	2.080	84	72	81	122	73.3	0.48	105	50.36	7.91+	7.91+

TABLE II.

Showing the mean temperature compared with the mean average for 45 years, the highest and lowest temperature, and the monthly range, the mean daily range, and the greatest change in 24 hours, for each month of the year 1876.

MONTHS.	THERMOMETER.					GREATEST CHANGE IN 24 HOURS.		
	Mean.	Compared with aver- age of 45 years.	Highest.	Lowest.	Range.	Mean Daily Range.	Degrees of Rise or Fall of Thermometer.	DATE.
January.....	31. °4	4. °5+	67°	9°	58°	8. °6	28° f	10th.
February.....	28. 3	1. 2+	57	-2	59	9. 1	32 f	2d.
March.....	33. 2	0. 6+	62	8	54	10. 8	23 r	5th.
April.....	43. 9	0. 8+	67	25	42	11. 8	22 r	12th.
May.....	54. 8	0. 3+	82	34	48	13. 8	30 r	27th.
June.....	68. 2	2. 8+	89	42	47	14. 3	27 r	2d.
July.....	74. 0	3. 4+	92	52	40	14. 4	22 r	17th.
August.....	68. 8	0. 1+	90	49	41	15. 2	22 r	29th.
September.....	59. 4	2. 5+	87	44	43	10. 9	20 r	1st and 4th.
October.....	48. 1	2. 8+	68	26	42	14. 3	22 r	30th.
November.....	40. 8	0. 8+	66	21	45	8. 6	23 f	3d.
December.....	22. 9	6. 6+	44	2	42	7. 1	33 f	16th.
Whole Year.....	47. °8	0. °1—	92°	-2°	94°	11. °6	33° f	Dec. 16th.

The population of the State is probably somewhat more than 260,000. By the census taken in 1875, it was 258,239. Adopting what we believe to be the correct statement of the area of the State, it is more densely peopled than any other State. We make the number of inhabitants to the square mile to have been, in 1875, in Rhode Island, 244.9.

In ten years preceding the census of 1875, the population increased 39.61 per cent. The gain is greatest in the city of Providence and the adjacent towns. The manufacturing villages and townships also increased far more rapidly than the purely farming towns. Several of these are nearly stationary, or even lessening in the number of inhabitants. Thus there is a marked tendency to centralization, the growth being principally in Providence and its neighborhood, in villages where water-power is abundant and convenient, and in a few points which are favorably situated for fisheries and navigation.

This disproportionate growth of the compact and manufacturing places depends in a great degree on the influx of foreign-born inhab-

itants with their families. The number of foreigners in the State according to the census of 1875, was 71,630.

In 1850 the population of foreign birth in Rhode Island comprised 15.66 per cent. of the whole population, in 1860 it was 21.46 per cent., in 1870, 25.48 per cent., and in 1875, it had increased to 27.73 per cent.

The foreign class are found to have a larger proportion of adults in the marrying age, to be more disposed to marriage in hard times, and to have on an average more children to every marriage, than the native class. Hence, a large number of children are growing up, who are born here, but in all their associations, their early training, and the sanitary, social, and moral influences that surround them from their infancy, properly belong to the foreign class. The distinction by *parentage*, therefore, becomes more important than that by *nativity*. By far the largest part of the foreign are Irish.

There were in the State, at the time of the last census, 6,271, colored inhabitants, including a few partly of Indian descent. The colored inhabitants are so few that they have little effect on the general character of the statistics. They usually report more deaths than births, and are particularly liable to consumption. They are thought to be somewhat less subject to epidemic diseases than the whites. In several years, the registered deaths by respiratory diseases among the colored were three times as many as those by zymotic diseases.

The mortality of Rhode Island is very fully illustrated in the annual reports on registration of births, marriages and deaths:

“The number of deaths reported in Rhode Island in 1877, according to the Registration Report of Dr. E. M. Snow, was 4,450; this was 334 more than in 1876, and more than have been recorded in any previous year. The death rate for the year as given on page 48, was one to 58.03 of the population, as given in the census of 1875, or 17.2 in each thousand. In 1876, the rate was one death in 62.7 of the population, or 15.9 in each thousand; in 1875, it was one death in 59.8, or 16.7 in each thousand.

As a large proportion of the deaths occurred in Providence city, which has so large a share of the population of the State, we give the population, number of deaths and rate of mortality separately for the city and the rest of the State:

	Population.	No. of Deaths, 1877.	One Death in	In each 1000.
Providence City.....	100,675.....	1,938.....	51.9 or.....	19.25
Rest of State.....	157,564.....	2,512.....	62.7 or.....	15.94

The difference in mortality between the city and the rest of the State is not so great as it was in 1876, which was the first year in which the distinction was made. It should be remembered that in some towns in the State the returns of deaths are quite incomplete, which fact will account for some of the difference between Providence and the rest of the State."

The following Table from the same Report gives thirteen principal causes of death in Rhode Island, and shows the order in regard to the number of deaths from each, in each of the last three years, and also in the aggregate of deaths for twenty-two years and seven months, from June 1st, 1852, to December 31st, 1874:

1877.	1876.	1875.	June 1st, 1852, to Dec. 31st, 1874—22 yrs. 7 mos.
Whole Number....4,450	Whole Number. . .4,116	Whole Number....4,317	Whole Number....64,514
Consumption..... 661	Consumption 655	Consumption..... 650	Consumption . . . 10,651
Diphtheria 492	Pneumonia and Conges. of Lungs 339	Pneumonia and Conges. of Lungs 400	Old Age..... 3,493
Cholera Infantum. 259	Cholera Infantum. 250	Cholera Infantum. 318	Pneumonia and Conges. of Lungs 3,471
Pneumonia and Conges. of Lungs 226	Old Age..... 241	Old Age..... 216	Cholera Infantum. 3,175
Old Age..... 213	Heart, Diseases of. 166	Heart, Diseases of. 186	Scarlatina 3,023
Heart, Diseases of. 182	Apoplexy and Paralysis..... 165	Scarlatina 185	Fevers, Typhoid, &c..... 2,522
Apoplexy and Paralysis..... 181	Diphtheria 159	Fevers, Typhoid, &c..... 170	Heart, Diseases of 2,295
Cancer (all kinds). 135	Fevers, Typhoid, &c..... 126	Apoplexy and Paralysis 166	Apoplexy and Paralysis 2,067
Fevers, Typhoid, &c..... 134	Accidents (all kinds)..... 114	Accidents (all kinds) 130	Dysentery 1,975
Accidents (all kinds)..... 132	Cancer (all kinds). 106	Convulsions and Fits..... 100	Accidents (all kinds)..... 1,973
Croup..... 95	Croup..... 102	Croup..... 96	Convulsions and Fits 1,357
Convulsions and Fits 83	Convulsions and Fits..... 89	Cancer (all kinds). 95	Croup 1,300
Scarlatina 62	Scarlatina..... 80	Diarrhoea..... 70	Hydrocephalus.... 1,054

In examining the diseases to which deaths are ascribed, we are well aware that scientific precision of diagnosis cannot be expected, in records gathered from the clerks of different towns, where the amount of general information and the modes of using terms vary. The law requires that the cause of death be certified by the attending physician; and in many parts of the State this is done. But the defects are great enough to deprive the results of value as the basis of exact and general deductions. Still, it must be remembered that many of the more important diseases are so easily diagnosticated and so generally known, that the figures may be trusted, as showing, with essential accuracy, the proportion of deaths due to them in each successive year, and as illustrating the laws of the several diseases.

DIPHTHERIA.

BY

JAMES H. ELDREDGE, M. D.,

OF EAST GREENWICH.

DIPHTHERIA.

The great prevalence of diphtheria in this State, and I may say everywhere throughout the country, the great mortality which attends it, and its very distressing character, have very properly suggested it as a subject for investigation and discussion. It is not without distrust of my ability to do justice to a subject of so much importance, that I have, in obedience to your commands, Mr. President, prepared a short paper, as an opening to a discussion, which I hope may bring out from others something of more value than anything I can present myself. The first death from diphtheria was recorded in the town of Warwick in 1861, and in East Greenwich in 1864. Since that time up to the first of January of this year, the records show from this cause eighty-one deaths in these towns. They have occurred in the following order: In 1861, 12; 1862, 5; 1863, 5; 1864, 11; 1865, 5; 1866, 2; 1867, 1; 1868, 2; 1869, 5; 1870, 7; 1871, 11; 1872, 2; 1873, 2; 1874, 7; 1875, 3; 1876, 2. Four in the month of January, 1 in February, 2 in March, 4 in April, 6 in May, 6 in June, 5 in July, 11 in August, 5 in September, 8 in October, 15 in November, and 14 in December. Sixty-six of these were under six years of age; about equally divided between the sexes. It has at no time been epidemic, generally breaking out, as it seemed, sporadically, in different localities, confining its ravages to one family, or to a very small neighborhood, carrying off three out of five, or four out of seven children in a family, and then disappearing for a whole year, or showing itself three or four times in this way in some years; the farm houses in the country being quite as often selected as the more crowded houses of the village. In the summer of 1866, in the month of August, three children in the family of a well-to-do-farmer died in one week, and there were in that year only two other deaths from this cause in the town of

Warwick. These eighty-one deaths may be said to represent about five times as many cases, for the proportion of fatal cases in these circumscribed, local epidemics has been, as near as I can estimate it, about 20 per cent. The disease as it was first recognized in 1861, had the same malignancy that it has now, one of its features being the fact that the first cases in these local outbreaks were generally the fatal ones. In the year 1877 there have been reported in the towns of Warwick and East Greenwich, forty-seven deaths from diphtheria, more than from any other one disease, diphtheria having this year reached that bad eminence so long held by consumption. Of these reported deaths, one was in April, four in June, one in July, four in August, twelve in September, twelve in October, four in November, and eight in December; thirty-five were children under six years of age, ten were over six and under ten, and four over ten: twenty-four males and twenty-three females. These forty-seven deaths represent approximately two hundred and thirty-five cases in a population of about fifteen thousand. This is the sum of my experience with diphtheria since its first appearance under its proper name. I presume it differs but little from the average practitioner in the country, and that other parts of our State have had about the same proportion as that of Kent County over which my personal observation extends, and that the increase that we had this year has not been peculiar to these towns.

These statistics confirm the statements of Dr. Snow, that the fatal forms of diphtheria are very much confined to children under ten years of age, and that its period of greatest prevalence is in the fall and early winter months.

The first question which presents itself in the discussion of this subject is its history: Is diphtheria a new disease, which has shown itself and prevailed in an epidemic form only in the last half century? This is rather a popular than a professional inquiry, and may be answered without hesitation in the negative. This disease is known to have existed in remote times, and is described by the earliest medical writers. It is only from the fact that it has been brought to notice under a new name, which its most important pathological feature has given it, that this question has in any way arisen. As the *malum Egyptiacum*, *Angina maligna*, *Cynanche maligna*, and as *scarlatina* without efflorescence, diphtheria has been recognized and accurately described by the standard authorities of the last century. In the *Encyclopedia of Practical Medicine*, of Forbes, Tweedie and Conolly, published in England about 1842, and in this country republished, under the supervision of Dr. Dunglison, in 1845, no place is given to diphtheria as a distinct

disease, but it is accurately described, and the work of Bretonneau referred to in the article on diseases of the throat, and again under croup by Cheney, and the latter writer protests against classing with croup, a disease in which there are marks of septic changes in the blood, and in which the pulse is but little accelerated, the skin harsh and dry, the breath fetid, and the debility extreme. Under scarlatina, varieties of the disease are described as scarlatina without efflorescence, which would now be called diphtheria. I can myself remember cases of this kind in my father's practice, and in the early years of my own, scarlatina without the rash, which would now be called, and very properly, diphtheria. It will be generally admitted that this is not a new disease, but that it was recognized and known to prevail extensively as an epidemic in different countries, and that in the due course of pathological investigation, its characteristic features have been found sufficient to give it a place in modern nosology, and separate it from the kindred diseases with which it has been confounded.

What are the causes of diphtheria, and to what can we attribute its marked increase at the present time? There can be no doubt that faulty hygiene, or disregard of the laws that regulate the common affairs of life in every village and in every household, will contribute to the increase and aggravate the malignancy of this disease as well as of all other diseases. Where there are such decided characteristics, such peculiar features, it is reasonable to suppose there must be some specific cause, some noxious agent which breeds diphtheria and nothing else. Whether this noxious agent may be the spore of some fungoid vegetation, which pervades the atmosphere, at certain times, everywhere, but, like the spore of the mushroom, only starts into active growth under favorable conditions of soil and temperature and proper degree of moisture, is a proper question. Seeds of many plants we know remain dormant for many years, sometimes for centuries, and then, under changes, germinate and grow as if recently planted. May it not be so with the seeds of disease, and of this disease especially, everywhere present, but only starting into active life under the conditions which favor their growth;* these conditions being all those depressing influences which we may sum up under faulty ventilation, defective food and impure water, and the peculiar attraction which the system presents between the ages of two and ten years, and the favoring influences of certain seasons.

* An intelligent gardener making up his beds for mushrooms, bestowed much more care with the compost and the amount of light and heat and moisture, than with the seed. Indeed, he said he "would rather take his chance for a crop without sowing seed, than with careless preparation and seed in profusion."

Whether the noxious agent which may be supposed to be the specific cause of this malady is a certain fungoid, cryptogamic vegetation, which attaches itself to its favorite locality, producing first a local disease, and then secondarily, affecting the general system by absorption, or whether the reverse is the order in which the symptoms progress, is not yet fully settled, and is a point for discussion, and an important one; for if we can arrest the disease by destroying at the outset, before the system is affected, these local manifestations, its further progress may be prevented. My own observation, which is, of course limited, leads me to believe that diphtheria does not differ from other diseases of kindred nature, that it has its period of infection and incubation, a series of premonitory symptoms, and then the local affection and general constitutional disturbance.

Whether it is contagious or infectious is another point upon which there is a great difference of opinion; but this, after all, may be more a difference in mode of expression than any great difference in meaning. If we say that a disease is not infectious, unless it is almost invariably the rule that those who are exposed to it, unprotected, take it, as in the case of small pox or measles, then few diseases are infectious; but if, on the other hand, we call all those diseases infectious which a person is more likely to contract by coming within range of their influence, than by keeping out of it, then the number of infectious diseases is very large. If this latter rule applies, diphtheria is clearly infectious. The risk of contracting the disease is much less kept at a distance, than permitted to approach it. When, however, cases occur in clusters, as they generally do, it may not be the infection, but the primary cause which produces it, the same in the successive cases as in the first, and this view is supported by the fact that the first cases are generally more violent than the last, when we might be led to expect that the later cases, if the result of infection, would be more malignant as the virus became more concentrated. There is no dispute about the fact of its contagious character. It is not an unwise precaution to isolate all cases as far as practicable, and to keep all children under ten as far removed as possible, from the presence of the sick room.

We can hardly err in making a diagnosis of a well marked case of diphtheria, for it presents appearances which are seen in this disease alone; and the train of symptoms which follow are such as follow diphtheria and diphtheria only. All cases, however, are not well marked and there may be much uncertainty in deciding at the outset the true character of some slight, obscure or irregularly developed case. All inflammations of the fauces should not be hastily pro-

nounced diphtheria, but only when we are obliged to do so by the pathognomic sign which this disease presents, should we use the formidable name. Not unfrequently the messenger who comes for the physician announces the nature of the disease we are to meet; and generally the announcement is right, although neither the messenger nor any one in the family or neighborhood may have seen a case before.

After a period of malaise varying from a few days to a few hours, a swelling and soreness of the throat is complained of, at the same time there is swelling of the glands of the throat and neck not only immediately outside the inflamed parts within, but under the chin and on the neck behind the angle of the jaw. If examined carefully a white patch, like a piece of soiled white kid, will be seen adhering to the surface of the tonsil or adjacent parts. This spot is not like a cut out ulcer lined with the membrane; but a patch loosely laid on to the inflamed surface, but found to be incorporated with the mucous membrane if the attempt is made to remove it.

The outward swelling of the glands of the throat and neck is a feature almost as marked as the false membrane within—as if these faithful sentinels had exercised their functions to the utmost extent to exclude from the blood the poison which the absorbents had taken up. As the disease progresses, the nasal passages are invaded, the peculiar inflammation extends through the lachrymal duct to the eye and to the ear through the eustachian tube, and spreads downward to the larynx and trachea, too often with fatal results. The countenance is puffed or swollen and of an ashy hue. The blood is vitiated and extravasated into the tissues and escapes in hemorrhages in every form; and the fetor from all discharges is very marked—sometimes plainly perceptible before entering the sick room.

This is a brief description of a case so marked as to be recognized by those who see it for the first time.

When these decided manifestations are not present, we may suspect diphtheria if the constitutional symptoms are disproportionate to the local affection; where there is long continued loss of appetite, and loss of strength and of flesh; and we can have no hesitation when any of the forms of local paralysis which are peculiar to diphtheria show themselves.

With scarlet fever diphtheria has been often intermixed and confounded. In the first we have not only the efflorescence, but high febrile excitement, high temperature and rapid pulse through the whole course of the disease. The swollen glands frequently suppurate

and local and general dropsy, with albumenuria follow, and not the peculiar forms of paralysis, as in the latter. In scarlet fever a second attack is the exception to a general rule,—in diphtheria, after one attack, there is a tendency to a recurrence, rather than exemption.

Are membranous croup and diphtheria identical? This is a mooted point; but generally admitted to be decided in the negative. Diphtheria may result in croup, but croup will not result in diphtheria. There is false membrane in both, but in croup it originates and is confined to the air passages, while in diphtheria the air passages are affected secondarily; in one the fever is active, in the other typhoid; in one the cases are single, in the other they come in groups; in one the local affection predominates, in the other constitutional symptoms are as strongly marked as the local.

In the prognosis of diphtheria we have the same uncertainties as in scarlatina. Some cases are so slight as hardly to be recognized, but still not free from danger, and these as well as the graver cases, are followed sometimes by symptoms which may prove fatal. Albumenuria, as in scarlatina, is a dangerous and very common complication, the swelling of the sub-maxillary and cervical glands is in some degree a measure of the extent of the disease. Hemorrhages, and fetor of the breath and discharges, are very unfavorable indications. A temperature of nearly a natural standard, and a pulse regular and slow, cannot be taken as a sign of encouragement, as it is in other febrile diseases, nor can the fact that the mental faculties remain, sometimes in the worst cases, unclouded and undisturbed to the last moment of life.

The treatment and means of arrest and prevention are points of far greater interest in the discussion than any others. In a disease so variable and capricious, where at one time we find almost all cases fatal under all treatment, and at another all recovering, whether treated or not, it is difficult to fix upon facts or to arrive at correct conclusions. The treatment is local and general. It is important that in pursuing one we should not ignore the other, on either hand; the difference in opinion in regard to the order in which the symptoms make their appearance, should not materially modify the treatment, although greater or less importance may be put upon local applications, as the opinion prevails that the local manifestations take precedence of the constitutional symptoms, or the reverse. One procedure is not incompatible with the other, and both are necessary. If in the order of progress, the local symptoms come first, even then, at the earliest moment of observation, the system is already affected by the rapid development

and absorption of the fungoid vegetation into the circulation and into the tissues, and into the recesses of the body where no local application can reach them. Nor are the local applications of less importance if the system is primarily affected. The advocates of these different theories do not differ materially in their mode of treatment, so that it is of but little consequence, practically, upon which side one's action is based, being essentially the same. The "savage energy" with which powerful caustics were applied to the diphtheritic patches, by recommendation of Trousseau and others, has long since been discontinued, and milder measures substituted, in the form of antiseptic lotions and gargles, less potent and less disagreeable. We can remember with how much reliance we used the solid stick of nit. silver, or very strong solution of the same, in all these cases, as an essential part of the treatment, and how we learned after a while that a weaker solution answered as well, and finally that the weaker we made it the better it was, and now I believe that it is but little used for this purpose. The chlorate of potassa, with the addition of muriated tr. of iron, or muriatic acid, the sulphocarbolate of soda, permanganate of potash, borax, alum, salicylic acid, and other preparations of this nature, have been found to accomplish all that can be done in the way of gargles, lotions and topical applications.

Alcohol, in its various forms is a good topical application. Lumps of sugar, saturated with spirits of camphor, give relief where the patient is old enough to use it and appreciate it. To sustain the system with food, stimulants and tonics, until the malady has run its course is the chief indication: Milk and eggs and broth and juice of beef, with wine and whiskey and brandy. Milk is generally the most agreeable. The great difficulty is to overcome the repugnance to all food. When it is found impossible to administer it by the mouth, it may be given by injections, as may be the medicines. Quinine as a tonic in one, two or three grain doses, suspended in water with powdered liquorice root, is most reliable, and in this way easily taken. Muriated tr. iron, cit. iron and quinine and salicylic acid, with borax, have all been used with benefit as a change, or alternately with the quinine. Hot vapor and sprays are of great service, and sometimes the only means we have of making topical applications in small children, and sometimes in those of larger growth, who happen to be a little perverse. Cologne or rose water, added to the solutions used makes them more acceptable. Vapor of lime water or of vinegar or of simple water hastens the process of suppuration and detachment of the false membrane. Stimulating applications to the outside are of no service,

and perhaps add to the discomfort. If it is thought that these cryptogamic vegetations, which characterize this disease, can be easily destroyed, either by medicine administered internally or by topical applications, we have but to refer to experiments made for the purpose of testing the power of different remedies. It was found by Oertel that exposure for twenty-four hours to 14° and 7° Fahr., and to boiling water for fifteen minutes, failed to destroy their vitality, or even their power of proliferation. And the same result was obtained by treating with the solutions which we so much rely upon for the destruction of these organisms, chlorate potash, chlorine water, quinine, sulphur, &c. These were no more effectual than hot water or the freezing mixture. Alcohol was found to answer the purpose better than anything.

A very nice point comes up very often for prompt decision. In the management of these critical cases, where the false membrane is found to extend to the larynx and air passages, shall we recommend a resort to tracheotomy or not? Can there be no rule to guide us? If there is such a condition as to give little or no chance for recovery without this complication, if the glands of the neck are very much swollen, if the nasal passages are affected, the complexion bad, and the breath fetid, we should but bring odium upon the operation, if we should resort to it; but if without this complication, there is a good prospect of recovery, if the general system is in a good condition, the operation should be recommended and resorted to as soon as practicable after the extension of the false membrane into the windpipe is discovered, for it is certain that this state of parts does not tend to recovery, and unless relief is given by an operation a fatal result is inevitable. The complications which come in the period of convalescence, and the sequelæ which follow the malady are more troublesome, and more often fatal, than in any other disease. Syncope is a common occurrence, and is always dangerous. It does not appear to be owing to mere debility, but to some more serious cause, obstructions in the large blood vessels or heart. The peculiar vegetations, which are supposed to characterize this disease, are not confined to the surfaces upon which they appear, but pervade the tissues and vessels and form collections, which not only plug the capillaries, but the larger vessels. The forms of local paralysis, which constitute one of the chief diagnostic marks of diphtheritic affections, are not only exceedingly annoying, but sometimes dangerous. Muscular fibres, which are covered by micrococci, are said to degenerate and slough, impairing permanently the parts affected. I have known, during the last summer, two cases of complete paralysis of the throat, so that the voice was not only lost,

but the power of deglutition; fluids of the blandest sort flowing back through the nose, and solids causing alarming fits of strangulation. Both of these cases were fatal from debility. Food could not be taken in sufficient quantity to sustain life, although they were nourished as far as possible by injections into the rectum. The tendency in these cases of paralysis is generally to slow recovery. They do not respond very sensibly to treatment with strychnia, or to galvanism in its various forms, means which are generally resorted to and indicated. Prophylactic measures are all important in times of diphtheritic epidemics. Not only should precautions be taken against infection and contagion, but every care taken to remove those unwholesome surroundings which are to be found almost everywhere, and which increase and aggravate all kinds of disease, and may be said to generate this. That all sorts and conditions seem equally affected, is not a proof that faulty household arrangements do not favor its increase. The modern improvements in the way of cess-pools and covered drains, unless properly constructed, are no better than the unsightly open drains and slop receptacles so common in the farm house in the country; and the convenient bath room and water closet are not always an improvement on the more remote privy. It is well to enquire closely into the quality of the air we breathe, particularly in the night time; what water we drink and what food we eat.*

I have given in this brief way, Mr. President, the sum of my own experience and observations in this malady as it has appeared in the last sixteen years in that part of the State over which my circuit may be said to extend. Not proposing to offer any new theory, but to express an opinion upon some of those points which may be consid-

* During the summer of 1877 the brine accumulated daily in making ice-cream, amounting to three or four pailfuls, was thrown into a pit dug in the garden about thirty feet distant from the well, on the up hill side. Early in the fall the water in this well became brackish and unfit for use. Sometime in November, another well across the street, full one hundred and fifty feet from the place of deposit for the brine, was affected in the same way, the water being so salt as to be perceptible in tea and coffee and altogether unfit for use.

The region about was underlaid with rock fifteen feet from the surface having a dip to the north and east, in the direction of the affected wells. The overlying earth was made up of sand and gravel and the rock was traversed with seams. If, under these conditions, water holding in solution common salt can be carried so far, is it not possible that holding in solution impurities less palpable but more hurtful, it may take the same course? The cess-pool and covered drain are somewhat modern improvements about the better class of farm houses and in the more recently constructed tenements in factory villages. May not the accumulation of filthy water in these bottomless pits, and of other filth in privy vaults in close proximity to the wells contaminate the drinking water in an insidious way, only to be made known by the prevalence of some disease like typhoid fever or diphtheria? And would it not be a wise precaution to have all these receptacles for filth made water tight? and would it not also be a wise precaution so to examine the natural under-ground drainage as not to locate wells in the course of flowage from contaminated sources, even at the expense of inconvenience as to distance, or cost of digging them?

ered as not yet fully settled. I have stated that in the towns of Warwick and East Greenwich, from the 1st of January, 1861, to the 1st of January, 1877, sixteen years, there have been recorded eighty-one deaths from diphtheria; that sixty-six of these were children under ten years of age; that more deaths were recorded in November and December than in any other months, and that the number of deaths may be said to represent about four hundred and fifty cases; that in the last year in these towns, forty-seven deaths have occurred, manifesting the same peculiarities of age and season as in the sixteen previous years. Second—That a disease of such very marked features must have a specific cause. Although, as in other diseases, this noxious, specific agent, whatever it may be, is rendered more actively virulent by any unfavorable conditions of living; that it is infectious, if infection may signify a greater liability in those who are exposed to it than in those who are kept away, but that it is not invariably so, like small pox; that it is contagious beyond a doubt. Third—That it may be taken for scarlatina, from which it differs, however, in some prominent points; the fever is slight after the first few days; the pulse is but little accelerated, and the temperature but little raised. The swollen glands rarely suppurate, and the sequelæ come in the form of local paralysis, and not as dropsical effusion; that diphtheria may be croup, but croup is never diphtheria. Fourth—As to the order in which the symptoms are developed, I am led to believe that the system is generally affected before the local symptoms appear, and that the disease is not arrested, if it were possible to do so, by removing the local manifestations. Fifth—That the prognosis as in scarlatina, is uncertain, as the slightest cases may be followed by grave symptoms which may prove fatal; that the swelling of the cervical glands is some measure of the extent of the disease, and that hemorrhage and invasion of the nasal passages, and the larynx are almost invariably fatal indications. Sixth—That the treatment is with topical applications much milder than those first used; that the constitutional treatment should have for its object the support of the system until the disease has run its course—tonics, food and stimulants—and that it is not possible to destroy entirely the characteristic vegetations with the usual lotions and gargles, even if they could be reached; and also, when in the course of the disease the larynx is invaded we should recommend tracheotomy as early as possible, if the system is in such a condition as to warrant it, and, lastly, that preventive measures are quite as important as the treatment, and they consist of the careful observance of general hygienic rules.

ON CAUSES OF
ILL HEALTH AMONG WOMEN.

BY

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ON CAUSES OF ILL HEALTH AMONG WOMEN.

Many of the causes of ill health among women having their origin in the fashions and customs of the day are supposed to have but temporary effects, as may be the case sometimes, but we are apt to forget heredity. The things which are truly only of the present, will change whether they are attacked or not; to get at and to prevent evils we must work now for the next generation, looking upon each child as a future grandparent, and teaching it that it owes a duty to its posterity and through them to the world, which they have the power to bless or to curse.

To begin at the root of the matter, each man and woman should consider the prenatal influences of their offspring, and endeavor to make these as perfect as possible, according to the best intelligence and information they have. The health of women during the child-bearing period, both the mental and moral, as well as physical condition, their work and recreations, their surroundings and their thoughts, are reproduced in their children, and while some attention is given to the so-called and much mis-called mother's marks through frights and whims, and which often only show the weak-mindedness and lack of self-discipline of that mother, little attention has been paid to their prevention, or to the good that might be wrought out by the well trained mind and disciplined character of *both* parents.

After its birth immediately there begins a mismanagement which affects its health and longevity. Through ignorance and superstition every hygienic law of food, clothing, bathing and sleeping, is abused.

Then when nature demands active exercise for growth and muscular development, repression is the only idea, the convenience of the adult being considered of more importance than the well being of the child. The primary public schools, presided over chiefly by young girls who have not themselves learned self-government, are governed also by repression and confinement to one position for a length of time difficult even for adults. Until puberty, the sexes are about equal mentally and physically, but then the idea of repression shows itself more forcibly upon girls. The study of anatomy teaches of the growth and development of bones in the growing child. The pelvic bones which have had several centres of ossification begin to unite at about the thirteenth year, three bones joining into one. The sacrum also ossifies more perfectly, completing this process at about the twenty-fifth year. During these years, when the whole future health of the woman, depends upon the perfectness and completeness of this pelvic development, and when girls should be allowed the greatest freedom of muscular movement, *repression* is still more enforced. She must not romp, she must have quiet manners, she must be shut up indoors until her vital powers are reduced. When she does go out she must be dressed to form such a figure as is demanded by the ignorance of fashion; long dresses, the weight at the bottom, furthest from the point of support, the weight and heat of which falls upon the growing pelvis with excessive and unequal pressure, changes the natural gait. Close fitting, if not too tight corsets, misnamed supports, which impede respiration, circulation, digestion and the peristaltic action of the intestines, thus producing one of the chief causes of constipation with all its recognized train of evils, so much more common among women than men; weaken the power of the muscles which aid in child-birth; also pads over the breasts which impede their natural growth and deprives them later on of one of the privileges of maternity. No thought is given to preparing the body to facilitate future child-bearing. The spine is heated and distorted, and though women have and wear more clothes now than did those of the last century, they are ill protected just where most clothing is needed. Cold feet and a hot head is a frequent condition; the feet and limbs are not warmly dressed, the head is heated by false hair and by wearing the bonnet indoors. Much has been said on dress, and efforts made at reform so far as underclothing, and yet even our wealthiest women who have least excuse are insufficiently clad. Efforts in this direction have also had some effect in regard to the size of the waist, but there is still too much compression,

The excitements of social life are greater in this country than in Europe, and girls are allowed them at an earlier age; the late hours and insufficient sleep during the hours authorized by nature, all tend to induce early and excessive menstruation, to disturb the nervous system, and to derange the function of every organ, making us notorious among nations as nervous temperaments and subject to nervous diseases. It is not merely going to places of evening amusement and excitement, as concerts, theatres, balls, &c., but too early partaking in them themselves, as in exhibitions of all sorts. Our public schools set a bad example in this.

Fictional literature gives girls romantic and unreal ideas as to marriage and domestic life; later, when they come to find the reality different, they grow to hate these cares and become restless for excitement. "*Si votre fille lit des romans a dix ans elle aura des vapeurs a vingt.*"

Among the poorer classes hard work is begun at this time of life, combined with ill ventilated homes, especially sleeping rooms, and such food as does not help in the healthy development of bone. Among the wealthier classes, indulgences in too rich and over stimulating food develop those national diseases, dyspepsia and catarrh. Dyspepsia was entailed upon us by our grandparents, with their salt pork and fried meats eaten by them even through the summer season; now we are passing it on to the next generation by our pies, doughnuts and highly seasoned food; even our school girls must have sweetmeats, cakes and pickles. Out door pursuits and games calculated to create muscular power, are discouraged because they do not accord with the general idea that an appearance of delicacy in form and complexion is more suitable for women. Here, also, we present a contrast to European women. The imperfectly performed light gymnastics drearily gone through with in our schools, is supposed to be sufficient to develop all the muscular power needed. One might as well teach children to play and laugh by rule, so far as any real development of muscle or mental relaxation is obtained. A more healthy performance of natural functions would promote efforts for the prevention of disease and secure more regularly established menstruation with more ease in its performance. "As the importance and relative value of a living being may be estimated by the length of time it takes to attain perfection, I may reasonably infer that the longer the reproductive apparatus lays dormant in women, the stronger will be their constitution, the more harmoniously will its functions be performed, and the more favorable will be the influence of this apparatus on the whole

system.”* Owing to the various excitements and stimulations above mentioned, first menstruation occurs early in this country and earlier among the higher classes than in the poorer. Unfortunately ignorant of these conditions, many mothers adopt a forcing system by medicines, baths, &c., often thereby destroying good health; while others allow girls to grow up in ignorance of this coming change, and when taken by surprise, the shock, the fright leads them into imprudences which result in hysteria. Many diseases are thus traced to the bad management of girls at puberty. “The effects of a badly passed puberty are seen in an over excitable circulation, excessive nervous susceptibility, dysmenorrhœa, sterility, * * * becoming at last victims of consumption or other disorders of which the foundations had been laid in an improperly conducted physical and moral education.”†

Physiology is taught only in the high schools which a large portion of the future mothers never reach, and there it is taught only partially with much positively needful for the youth, of both sexes, to know, carefully culled out. They are thus left to learn and continue to hand down to posterity, from the ignorance and superstitions of servants, or from the vulgar among their associates and from the obscene literature which is being thrown broadcast among our schools, what they should learn only from parents, or teachers capable of making them respect the highest functions of human nature. If the half time system, which has worked so well in England and Germany, could be introduced into our public schools, at least in the primary and intermediate grades, and the remainder of the time applied to systematic training in industrial work for, and by, both sexes, the working classes of our population would be better prepared for self-support, have a more healthy physical development and become better citizens. The graduates from our high schools are crowded with studies which they have no use for in private life, and which they soon forget, because crammed only to get their averages and percentages of rank, to obtain a diploma, that being the highest and often the only goal and without which they will not easily get situations as teachers, and they are fitted for no other career. They cannot all be teachers, the supply is greater than the demand, meanwhile other fields are waiting for laborers.

I place ignorance among the chief causes of evils, although I am frequently met with the argument that women have had time and op-

* “Preservation of the Health of Women,” E. J. Tilt, M. D., England.

† “Diseases of Women,” C. D. Meigs, M. D., Phil.

portunity to learn differently. Time is not so much needed as encouragement, or rather the *cessation of discouragement*. Women often see evils before them, know that they are evils, could be and should be remedied, but they do not know how to remedy them. Complaints are met with the idea that the right lies in making the best of, and being satisfied with what is. It may be suggested here that one remedy lies in the dissemination of *proper* knowledge by authoritative bodies, such as the Boards of Health in the various States. I say proper, because there is so much worse than useless trash learned through almanacs and the advertisements of empirics.

Women have generally been taught that they are to marry, to be mothers, and housekeepers. They have not been taught how to make marriage beautiful; and neither sex is taught the value of a power of adaptation to each other's character, and when the fruit of an inharmonious marriage is nervous and ill-tempered, the blame is laid on Providence, instead of where it rightly belongs, on the lack of knowledge of the laws which that Providence made, and meant should regulate marriage and procreation. But it is not only with the inharmonious marriages, in the best there exists an ignorance of child-bearing and its results, a forgetfulness that motherhood is the crowning glory of womanhood, which leads to an infinity of methods for the prevention of conception not necessary to refer to directly, for those who are ignorant of them are blessed and rewarded in their ignorance, —for those who do use them, there is always the punishment which nature awards her broken laws. I have frequently given my opinion for years past, that this prevention of conception leads to a large part of the diseases peculiar to women. Poor little Pip, in "Great Expectations," spoke as the representative of a numerous class when he said, "I was always treated as if I had insisted on being born in opposition to the dictates of reason, religion and morality, and against the dissuading arguments of my best friends."

I quote from an address by Prof. Maudsley, of University College, London, the following, because I want these ideas more widely known and meditated upon: "Take notice how little people ever think of the power which they have over their own destiny and over the destiny of those who spring from them! How amazingly reckless they show themselves in this respect! They have continually before their eyes the fact that by care and attention the most important modifications may be produced in the constitution and character of the animals over which they have dominion—that by selective breeding an animal may almost be transformed in the course of generations; they perceive

the striking contrast between the low savage with whom they shrink almost from confessing kinship and the best specimens of civilized culture, and know well that such as he is now, such were their ancestors once; they may easily, if they will, discover examples which show that by ill living peoples may degenerate until they revert to a degraded state of barbarism, disclosing their former greatness only in the magnitude of their moral ruins; and yet seeing these things, they never seriously take account of them and apply to themselves the lessons which lie on the surface. They behave in relation to the occult laws which govern human evolution, very much as primeval savages behaved in relation to the laws of physical nature, of which they were entirely ignorant,—are content with superstitions where they should strive to get understanding and to exert intelligent will. They act altogether as if the responsibility for human progress upon earth belonged entirely to higher powers, and not at all to themselves. How much keener sense of responsibility and stronger sentiment of duty they would have if they only conceived vividly the eternity of action, good or ill; if they realized that under the reign of law on earth, sin and error are inexorably avenged, as virtue is vindicated, in its consequences; if they could be brought to feel heartily that they are actually determining by their conduct in *their* generation what shall be predetermined in the constitution of the generation after them! For assuredly the circumstances of one generation make much of the fate of the next.” Thus it is that people pay no regard in marriage to the evils which they bring upon their children; or in their lives to the sins by which the curse of a bad inheritance is visited upon them, and neglect to apply knowledge to the improvement of the race. When through more enlightened education, parental responsibility shall be placed on higher grounds, not only disease, but crimes will diminish, and in time we may “produce, if not a higher species of beings than we are, a race of beings, at any rate as superior to us as we are superior to our primeval ancestors.”* Too much cannot be said on the subject of heredity until it is believed, understood, and acted upon, for we have only entered upon research in this direction. As there cannot be good wine without fermentation, so every new movement has its opposers to raise discussion; thus “agitation of thought is the beginning of wisdom.” The objection has been raised that the belief in heredity is used too frequently as an excuse for various wrong doings and criminalities. This so far as true is not because the laws of heredity are too well believed and understood, but rather the contrary; and that there

* Maudsley.

is a neglect of their proper application, and these cases serve to illustrate that the inheritance was not recognized early enough in the individual and care taken to eradicate it or to stimulate the power and duty of self-control, and such qualities of mind and body as tend to oppose the natural bias, and which, by such care, one of the most fruitful sources of disease and crime may be diminished; for many things harmful to health and character, sound body and sound mind, are under human control. "When deviations or violations of the normal standard of physiology, perfect in structure and healthy in function, are continued through two or three generations, their effects become more marked and intensified. As all these changes are brought about by human agency, the remedy is lodged in the same hands."* "So to observe nature as to learn her laws and to obey them, is to observe the commandments of the Lord to do them."†

As to housework, with all its monotony of routine, its confinement, often to ill-ventilated rooms, its constant wearying muscular movements, its long hours of work, its lack of change of thought and scene, not one of these conditions changed even during the periods of child-bearing, what wonder that women break down and wear out? What other fate could be predicted for them? These influences can not be salutary either to bodily or mental health. Here, also, ignorance plays a large part. Many persons who consider themselves good cooks would be astonished to be accused of being the cause of indigestion, of diseases of the skin, of the blood, of the nerves, &c., &c., in their families. There is now a movement at work in New York and Boston, and about to begin in Providence, for the training of cooks. Boston has cooking clubs of ladies, not in training for servants, but for their own improvement. These schools are not for the teaching of making doughnuts, pastry and such already too common mixtures and compounds, but to teach hygiene and chemistry, and such principles of physiology, that in the generation to come we shall know what material should be eaten by each individual for the necessities of his or her harmonious and equable growth and development. Such a training school should be encouraged by the whole community. Also, for teaching the preparing of proper nourishment for the sick, to take the place of the wretched slops now too frequently used. Also, training for other kinds of housework, that by more orderly method, time and steps and back-aches may be saved. Much that is valuable has been said and written by practical women on the organization of

* "The prevention of disease, insanity, crime and pauperism." A paper read before the Conference of Charities, Cincinnati, May, 1878, by Nathan Allen, M. D., Lowell, Mass.

† Maudsley.

household labor; when these ideas meet with more understanding and encouragement, so that they can be acted upon, we shall see fewer worn out women, consequently healthier ones, and healthier offspring.

However good the training it cannot be properly carried out until there is more improvement in the building and arrangement of houses, and for this we need women architects who will best know the necessities of women in this respect. There are in this city thousands of rooms which can *not* be ventilated thoroughly, which are not properly lighted, where work of any kind cannot be done to the best advantage, and which are choked by the fumes of tobacco and sink drains, and the odors and smoke of cooking. Many an overworked woman into whose life few bright leisure hours ever come, has thought seriously, deeply, broadly on these subjects, but feels helpless to change anything. She has no time to study, scarcely to converse with others, and in the attempt to draw her out to take part in some fresher, newer ideas and action, one feels that so long as the daily life is a perpetual struggle for existence, efforts to rouse the mind to other considerations seem unavailing. While speaking of cooking, I cannot forbear quoting a few sentences from an interesting and ably written paper by Mary G. Ware, for the Woman's Education Association, on "Prevention of Crime among Women." "Foul air nauseating the stomach, bad cooking irritating it, insufficient food exhausting it, want of sufficient clothes and fuel chilling the circulation, each or perhaps all together, stimulate the appetite for some kind of intoxicating drink." "Another efficient influence would be schools where women could be taught to cook in such a way that the family table should be a comfort and satisfaction. The dissatisfaction of the stomach which follows the eating of badly cooked food produces a desire for intoxicating drinks, so that the good cook promotes not only health, but morality." "The opening of diet kitchens in several cities is a movement in the right direction," where regulated so as not to encourage idleness and pauperism. "for the prevention of intemperance by the suppression of its causes." With the brain clogged by foul blood because the lungs are clogged by foul air, how can we expect high or even intelligent moral action? How much do the higher classes do to prevent, how much to encourage these evils? It has been said that it is easy to be a good Christian for one who has a sound spine and a sound stomach, so it is easier for one with bodily wants well supplied to resist the temptations of liquor and to refrain from crime.

In addition to cooking schools there is needed instruction on the importance of well ventilated and clean houses, and especially among

the poorer classes, of the necessity for the removal of all *effete* matters, and of the need of a good blood and bone making diet, in place of the half starving diet of bread and tea, which unfortunately has made its way among our working classes of all sorts, but especially of sewing women, as the popular diet. It is not wholly, if at all, a question of means to obtain better food, for tea is not cheap, but to the ignorance of cooking and of what is suitable and wholesome for them.

A cause of ill health among the women who work in mills, beside those included in what has already been said, are injuries to the digestion and to the nerves, by the habit of tobacco "dipping," not confined to the south, but practiced considerably in this State; these women also suffer from overheated air, whether dry or laden with moisture; and in cotton mills, dust from the carding process, (less since the modern improvements than a few years ago.) Among shop girls there is confinement in over-crowded, badly ventilated shops, deficient sunlight and outdoor exercise, air exhausted by gas and heated over repeatedly, too much standing, infrequent and irregular meals. After standing several hours, exhausted and needing good food, they are allowed often so short an interval at mid-day, that there is not time to go to their cheap boarding place or home, and are too poorly paid to afford a meal at a restaurant, they too soon learn what affords the most stimulus for the least money. Said an older shop girl to one recently from the country, "Don't waste your money on pie, get a glass of gin, its cheaper." Those who do not reach this degradation, yet take inordinately of tea or patent tonic medicines. "If the temperament be nervous and the work mental, there is much more danger from the use of stimulants than when the avocations are manual."* "As a rule, people are under-fed. This is especially true of women. The tone of the system is thus lowered and local congestions of different parts of the body are produced."† Diseases of the digestive organs, consumption and uterine irregularities prevail with this class of women.

The wealthier classes do not escape disease because of not being obliged to work. "In a discourse upon the consequences of employments, the case of the unemployed has really no place; yet this negative condition of doing nothing has its consequences, and very serious ones too, in connection with the health of its possessors. The lack of definite occupation, or of occupation satisfying the mind and conscience, and which is fraught with blessing, is especially the misfortune of

* Rachel B. Gleason, M. D.

† Wm. A. Hammond, M. D.

women, more particularly so in the case of unmarried women, in so called 'easy circumstances.' Among them may be seen the sad consequences of a purposeless, useless, selfish existence. What a lamentable array of disorders is their lot!—a group of nervous ailments, largely associated with the ill-defined and ill-understood condition called hysteria. "It is a praiseworthy feature of the present day that great endeavors are made to find employments for women, to enlarge the bounds of pursuits calculated to arouse their interest, and to foster physical exertion."* "In young women without useful occupation, the moral nature becomes perverted in addition to derangement of bodily health; the mother's sympathies too often only foster the morbid proclivities by insisting on the delicacy of constitution, and the necessity of various artificial methods for restoration. Such a girl is not the victim of high pressure or mental strain in her own person, but she may inherit a susceptible brain from an over-worked parent. The remedy is work, not rest, occupation, not idleness—a luxurious life is her curse. Insanity as well as hysteria is developed by such a mode of existence. Life must have an aim, although to achieve it there ought not to be prolonged worry."† "Skilled industry of the hands makes the brain more orderly in action. The child taught to use the hands skillfully is more apt to become an industrious citizen, and the habit of industry is the basis of orderly life."‡

Of causes directly affecting mental health, in addition to those already mentioned, among the working classes, there is worry from small wages, and intensity of anxiety night and day, causing sleeplessness; this also extends to all classes of women, the married from never having any sum or purse of her own, and consequently the utter misery that cannot be conveyed to the comprehension of the other sex; the ingenuity to make ends meet, the contrivances to avoid asking, especially when the need of economy is pressing upon them, even when the husband is generous and kind, all these, where the strain has been long-continued, the same set of ideas maintained in exhausting recurrence, the same part of the brain is kept continuously at work and a weakness results which may end in insanity.

It is said that insanity is on the increase, especially among the ignorant classes, and that only ten per cent. are cured. If this be correct, it is necessary that its causes should be searched for, and something done for its prevention. It is not an exclusively nervous disease, but

* Address of Dr. J. T. Arlidge, before the British Medical Association, 1878.

† "Insanity and its Prevention," D. H. Tuke.

‡ Mary G. Ware.

may and does originate in deterioration of the body through intemperance, dissipation in all its forms, over-work, mental and physical, meagre fare, lack of ventilation and neglect of moral culture. All these factors apply to both sexes, but bear more severely upon women, who have, in addition to their greater nervous susceptibility, the care and anxiety of children, menstrual irregularities, miscarriages and the consequent diseases of the pelvic organs. Absence of rational employment of the mental powers leads to indulgence in vices, drinking, &c., especially favorable to insanity in addition to the inheritance from parents who indulged in like habits, for "by free indulgence in stimulants and in tobacco, the parents debilitate their own constitutions, and transmit feeble ones to their children."* A superintendent of one of our New England hospitals for the insane has said that, "the dissemination of more correct views of the true way of living and a more rigid observance of the laws of health and nature, would greatly diminish insanity." The Commissioners in Lunacy in Scotland in a recent report said, "that insanity is to a large extent a preventable malady, that it is always attended with some bodily defect or disorder of which it may be regarded as one of the expressions or symptoms; preventable diseases will be diminished in amount when education is so conducted as to render the people both intelligent and dutiful guardians of their own physical, intellectual and moral health." "A study of the relation between modern life and insanity, shows that it is of a many-sided and complex character, that a large amount is preventable, that beer and gin, mal-nutrition, a dreary monotony of toil, muscular exhaustion, domestic distress, misery, poverty and anxiety, account largely, not only for the number of the poor who become insane in adult life, but who from hereditary predisposition are born weak-minded or actually idiotic."† "Insanity in women rarely takes place without the concurrence of both physical and moral causes."‡ Physicians have known for a long time that much insanity results from ignorance of the laws of life and health, or a disregard of them, and that it might be prevented by an avoidance of such habits as exhaust nervous power, but the community in general do not know this, and should be instructed. It is also well known to physicians that there are abnormal mental changes in women suffering from various diseases peculiar to their sex; and chief among the causes of these should be placed, forced abortions.

* Tuke.

† Tuke.

‡ "Insanity in Women." Dr. H. R. Storer.

To the increase of this evil, attention was called by Dr. D. H. Storer, in 1855, then Professor of Obstetrics at Harvard, in his public address introductory to the annual lectures. In 1857, the American Medical Association appointed a committee to report upon criminal abortion with a view to its general suppression, with Dr. H. R. Storer as its chairman; and in the volume of its Transactions for 1859, will be found a series of resolutions by which the Association present the subject to the attention of the several legislative bodies of the Union, desiring that the laws on this subject may be revised. In 1860, Dr. H. R. Storer, published a volume entitled "Criminal Abortion in America," in which he set forth the evils resulting, its increase in this country more than abroad, and the weakness of the laws in those States in which any existed. At that time Rhode Island had no statute, and here, as in some other States, in the absence of special statute, the crime could only be reached at common law, and this only if the death of the woman occurred; no thought being taken for the death of the child, or of the ill health of the woman for the remainder of her life. Thus, in States where a definite statute does exist, it is practically useless and is often avoided, because legislators and the public fail to recognize the true character of the crime. As, for instance, here in Rhode Island, the statute passed in 1872 takes no cognizance of the murder of the child, and if the mother die in consequence of the drugs given or local injuries done to her, the penalty is imprisonment for a term varying from five to twenty years. "How inconsistent to punish murder, attempted or committed, if by injury to the throat or heart, capitally, and if by injury to the womb, by temporary imprisonment; especially where this latter case always necessitates the slaughter of a second human victim."* The Rhode Island statute says: "or shall aid, assist or counsel any person so intending to procure a miscarriage," shall incur the same penalties. Could not these words be carried forcibly into every household? Not a day passes but they would apply to some one. The ignorance as regards the guilt and the low morale of the community on this subject, are so perfectly appalling that the boasting of repeated and successful accomplishment passes unproved; and the press, such a power in the land, that if it chose, it alone could almost annihilate the crime, apparently openly encourages it, by the advertisements of quack doctors, of medicines and even of so called private hospitals, where the secrets of the victims may be buried with their mortal remains. In 1866, Dr. Storer wrote an essay entitled "Why Not?" to which the American Medical Asso-

* "Criminal Abortion in America." Storer.

ciation awarded a prize with an order for its general circulation. This book should be read by every woman and man. Aside from all which a law, however wise or however strictly enforced could reach, are the cases which occur in private, cases known only to the woman herself, through ignorance of the laws of life and health, ignorance of her own anatomy, of her duties to herself, her child, the community and to her Maker.

An erroneous idea prevails, that in the early months of pregnancy, there is no sin, and little danger to the woman's life. This is the very reverse of the truth; for the earlier in pregnancy its occurrence, as a general rule, the greater is the danger to life or to subsequent health, the greater the physical shock, the liability to hemorrhage, the liability to subsequent uterine disease, even to the much dreaded cancer, the active symptoms of which may be delayed until the climacteric,—the liability to repetition from habit or the production of sterility, bringing often disappointment when afterward children are desired. Those who do not look deeply into these causes and effects, say that women are less fruitful now than formerly, and wonder why it is so? The answer is, because they will not let themselves be so. But women are not alone to be blamed for this crying sin of the day; they have also to bear a mental suffering from the discontent of the father, far more acute than that from the fear of, or care for the personal pain and discomfort, often amounting to the temporary insanity of despair, and, therefore, driven as it were, to abortion as the only relief, and often encouraged thereto. Interference with the laws of nature is always productive of disease, and this sin is confined to no class of persons; it prevails among the married and educated, even more than among the ignorant, the poor, the unmarried. The latter might be supposed to have an excuse, if an excuse for a crime could ever be offered. The same argument applies here as was used by Dr. Gerrish,* in speaking of the social evil, “the chief of these causes is ignorance. * * * that while a lack of ordinary information and learning is conducive to depravity, it is ignorance of the laws of our being which is chiefly responsible for the mischief; that the proper and competent teaching of physiology and hygiene to the young would result in such improvement of morals that, in time, prostitution would largely disappear for want of support and patronage. The limited number of occupations to which women are admitted, their less pay than men for equal work, the obstacles thrown in the way of their learning those kinds of business most desirable for them—these stand as deep and shameful blots on our social

* Prof. Mat. Med. Bowdoin. Address before Maine Med. Ass'n, Oct. 1878.

system. As the first step in the right direction, we should have the study of human physiology and hygiene taught in our schools." To this public instruction of physiology, objection has been made that it should be left to the private judgment or tact of individual parents, and to this I reply that, it cannot be so left, for the parents themselves are too ignorant, as I have seen in several instances, and also the terrible results of such ignorance, but the parents should be able to teach their children early in life, the wisdom of subjugating appetites to morality and to cultivate a regard for the rights of others.

That so many women should have no definite occupation throughout the best years of their lives, no aim or purpose, their faculties and talents unexercised or lost, are evils which are fruitful causes of unhappiness and ill health, the effect of which is to be seen in society and is not felt by women alone. "Statistics show that the evil diminishes as means of employment are open to women, and in those cities where most employments are open to them, the lowest proportion of those who lead an abandoned life is found. Every endeavor which is made to open new fields of labor to women is a direct blow at this social evil."* The moral elevation of women of the lower classes implies and involves that of the men also; they must rise or fall together. Girls should be taught useful industry and skilled handiwork to save them from ill health, sin and crime; to prevent them from becoming a burden to themselves, their parents, husbands, and at last upon the charities of the community and the State. Another cause of this social evil is strong drink, in both sexes—stimulants appear to be necessary to keep up the strength for the life of excitement. The prohibitory law of Maine closed many houses of prostitution—this should give a clue to the management of this evil. They could not keep up this life under that law, and therefore many were driven from the State, and for some years past, in my efforts to work among them, I had observed, before I found the cause, that many came from Maine.

As to the causes of the diseases peculiar to women, the immediate and direct are to be sought in each case, the predisposing causes which are avoidable and are incurred chiefly from ignorance and a disregard of the laws of health are thus enumerated by one of the latest authorities:†

"Neglect of out door exercise,

"Excessive development of the nervous system.

* Paper read before the Association for the Advancement of Women, 1874, by Ellen Mitchell, Chicago.

† Dr. T. G. Thomas, of N. Y.

- “Improprieties of dress,
- “Imprudence during menstruation.
- “Imprudence after parturition.
- “Prevention of conception,
- “Induction of abortion,
- “Marriage with existing uterine disease.”

To these might be added, Marriage with existing disease in the other sex. This list serves as a recapitulation of the chief topics of this paper. “No one will doubt the conclusion, that if in cold weather the feet, legs and abdomen of civilized women were clad in some woolen material; if they understood the necessity of caution during the period of menstruation and after labor; if they allowed the uterus to hold its proper place in the pelvis, uninterfered with by pressure; if they kept the sanguineous and nervous systems in their normal state of vigor by exercise, fresh air and plenty of good food, and at the same time avoided any habits which directly produce disease by injuring the genital organs, (including the breasts) much, very much less of uterine and kindred disorders would be seen by the physician. All these reforms would probably bring forth results in one generation, but it would require many generations of reformers to restore woman to her proper physical sphere.”* Before much result can be obtained in the physical improvement of women, a change of tone in public opinion is needed. Delicacy must not be confounded with refinement, or thinness and paleness admired for beauty, rather than a comely shape well rounded by the full development of muscle and a due proportion of fat. Sickness should be considered as allied to sin,—the sin of breaking the divine laws of nature; a person should be as much ashamed of avoidable sickness as of falsehood and stealing. When women can be made to appreciate these things and to believe that whatever interferes with the full and proper exercise of any function, is likely to produce irregularity in its performance and finally organic disease, then will they cease to be invalids and sufferers. “If we compare the present state of women in refined society over the world, with that of the working peasants of the same latitudes, or with the North American squaws, or the powerful negresses of the southern States, we can with difficulty believe that they all sprung from the same parent stem, and originally possessed the same physical capacities. Observation proves that women who are not exposed to depreciating influences can compete in strength and endurance with the men

* Thomas.

of their races, and in savage countries they are sometimes regarded as superior to them.”*

Knowledge of the causes of disease ought to help in the prevention, but does it? And why does it not, but because ignorance and selfishness rule both men and women, and women have in the past, been taught that they must do nothing to help themselves. Now that they have begun to realize that the regeneration of the world must come through them, they are aroused to form various clubs and associations for study and for practical efforts in all questions affecting the moral and physical condition of women, the effects of which will be seen clearly in the next generation.

I have here expressed my belief that ignorance is the first chief cause, at the foundation of all causes, and that therefore the responsibility should be taken up earnestly by those who have charge of public education and public health. It also concerns legislators who have to deal with questions of laws for crimes, to which ill health leads in either sex, to look more deeply into the preventable causes. My work will not have been ill done if any word herein shall elicit food for thought and action by and for women, for the improvement of the physical condition of the race.

A. E. TYNG.

* Thomas.

WHAT IS THE DIETETIC VALUE
OF
WINE, BEER, AND OTHER ALCOHOLIC BEVERAGES?

BY
L. F. C. GARVIN, M. D.,
OF LINCOLN.

Substantially as read before the Rhode Island Medical Society,
in December, 1870.

BEER, WINE, ETC., AS TABLE DRINKS.

The following article is not designed to treat of drunkenness, which, whether habitual or occasional, receives, even in this skeptical age, universal condemnation.

Nor does it aim to deal extendedly with ordinary dram drinking, in which at least two wineglassfuls of ardent spirits, five of sherry or port wine, or a pint and a half of strong beer or ale, are imbibed in the course of a day. Inasmuch as those who follow drinking to this extent are able usually to attend regularly to business, and are never seen "the worse for liquor," it is quite likely that persons may be found among the ill-informed, especially if their judgments are biased by personal indulgence, who defend the practice. Concerning this phase of drinking it need only be said that nearly all scientists, writers, and physicians, who by experiment or observation have qualified themselves to express an opinion, unite in pronouncing it unqualifiedly hurtful. Every medical practitioner is aware that the men who compose this great class, not bearing acute diseases well, swell the mortality of fevers and inflammations to undue proportions; he knows, too, how these persons, whose blood is scarcely ever free from alcohol, become the victims of chronic disorders, which long afflict them with gnawing and growing discomforts, succeeded by months or years of the most intense suffering, and, finally, bring life to a close when it should be in the prime.

To portray the effect upon the individual of so-called moderate drinking would require more time and space than has been allotted me. The best popular treatise upon the subject with which I am acquainted, and one well deserving a place in the education of our children, is by Dr. B. W. Richardson, entitled, "The Temperance Lesson Book."

My task, here, is to consider the question—upon which medical and scientific opinion is still divided—whether alcohol, when taken in the most unexceptionable manner, is serviceable in the maintenance of health. In other words,

IS ALCOHOL FOOD?

In defining the term food, we pass over the technical definitions which abound, and present one wholly practical. Food may properly be vended in the open market; whilst potent drugs should be dispensed by a competent apothecary under the direction of an educated physician.

It is scarcely necessary to show that alcohol is not a *necessary* article of diet. It is not present in the ovum, the sole nutriment of the embryonic state; nor in milk, the only support of infancy. It cannot be found in the animal or vegetable productions, pointed out by nature as the sustenance of adult life.

The elements of all these natural aliments correspond almost precisely with the proximate principles of the blood and tissues. Thus, in milk, a sample of the essential foods, exists water, chloride of sodium and potassium; phosphates of soda, potassa, magnesia and lime; iron; saccharine, oleaginous, and nitrogenous compounds, but no alcohol.

Following the lead of Liebig, many physiologists class alcohol with the hydrocarbons. His theory, that starch, sugar, oil and alcohol, act as “respiratory food,” has been overthrown; but, since it is certain that the three former articles do have some use in the system, a like value is ascribed to the latter.

The argument is, that alcohol and sugar, for instance, are nearly allied, because chemically they are composed of hydrogen and carbon, and by the simple process of fermentation, the one is derived from the other—only the volatile son of a sweet mother! Why, then, it is asked, may not both subserve the same ends in the system?

The resemblance is apparent rather than real. Glucose, by giving off carbonic acid and water, becomes wine alcohol, an easy transformation, it is true, but a step towards destruction. The process is precisely analagous to the decomposition of animal tissue. The carrion in the field bears the same relation to beef in the market that alcohol does to sugar. Yet while the one tempts the appetite in the form of Porter house steak; the other, introduced into the blood, gives rise to most fatal disease. Lineal descendants do not always reflect credit upon

their progenitors, as may be witnessed elsewhere than in the above examples of putrefaction.

Compare, likewise, their physiological action. Sugar is digested in the intestine, and thence slowly absorbed; alcohol passes immediately from the stomach into the veins. The one never reaches the arterial circulation; the other is found for hours afterwards wherever the blood courses, most and longest in the brain, the abode of manhood. The one, never in health, appears in the excretions; the elimination of the other at once begins by lungs, kidneys, bowels and skin. The one, taken in large quantity, satiates; against the other, the system never rebels, till it has paralyzed the power of deglutition. The one, in excess, merely disorders the alimentary canal; the other, by dethroning the reason, transforms man into a brute.

Certain recent writers have evidently perceived the difficulty of including alcohol among the hydrocarbons. Anstie, who has treated the question most extensively, creates a special class of foods, including alcohol, tea, coffee, cocoa, tobacco, &c. Without attempting to explain their *modus operandi*, he claims that they are capable of "averting death from inanition," and are therefore true aliments. If he stopped with this definition and classification, it might be granted. Theoretically, it is true that these articles, as well as the rest of his list, viz.: Chloroform, the Ethers, Strychnia, Morphia, Hyoseyamia, Atropia, Datura, &c., &c., are, under certain circumstances, maintainers of life.

Alcohol, without doubt, is no less a food than Strychnia or Atropia. But while he fails to recommend the trusting of the above deadly poisons to self-prescription by the people, he does, illogically, as it seems, assign a place to alcohol in ordinary diet. Not to dwell upon the inconsistency, we would consider the various arguments which he presents in favor of its use at the table.

First, alcoholic liquids are said to promote digestion. The action in the stomach is to coagulate any albumen present, and by local stimulation to cause a redness of the mucous membrane, and to increase the flow of gastric juice.

That is true. Is it desirable? Certainly, if one's digestion is perfect, any adventitious aid is superfluous, and had better be held in reserve for a time of need.

But suppose a man begins to realize that he has a stomach, and perceives, occasionally, after dinner, water brash, or a heaviness at the epigastrium, is it a matter of course that a "little wine for the stomach's sake" is demanded? A philosopher would seek the cause;

he might omit this piece of pie, or that dish of sauce, practice more thorough mastication, or accord a longer period of rest after eating. In a word, he would strike at the root of the disordered function.

Usually, in incipient dyspepsia, the removal of the cause is all that is required. But suppose a case be found in which the organ has not the power to prepare the requisite amount of food for assimilation, it does not follow that alcohol is the only or the best remedy. Perhaps it is bismuth, or strychnia, or pepsine, or gentian, or rhubarb that is indicated. These are the very cases which require the judgment of an educated physician. They are removed from the bounds of ordinary health; have become disease.

Again, says Anstie, alcohol is intended for those "ailments which are engendered of the necessary every day evils of civilized life."

Where one preaches that doctrine, thousands practice it. After the manner of a cigar, it produces a feeling of general comfort. Little aches disappear. The roughnesses of the journey of life are smoothed out. A physician, if kept awake all night by professional duty, is to make up the loss in the morning, as far as may be, by a few drachms of brandy. If the approach of an important operation produces in the surgeon a disagreeable feeling of trepidation, he is to steady his heart and nerves by an ounce of whiskey. If the hour of sleep finds him tossing on his bed with anxiety, a glass of wine will invite "nature's sweet restorer." If tired, or cold, or aching, or sleepy, or wakeful, or if in any way the nerves recoil under abuse, drink. Nay, more, since every day has its trials, it is well to accompany each meal with a glass of sherry or champagne, that duty may be made easy in advance. Such, we understand, is the argument in favor of alcohol, as a nervous stimulant in ordinary health. One might suppose that the moderate drinker would be free from all discomfort, superior to every infirmity of the flesh.

Theories are always beautiful until reduced to practice. They may be so perfect as to be irrefutable, except by the logic of experience. We will not, therefore, attempt an elaborate rejoinder to this one, but leave it to the observation of any rational man, whether a panacea has yet been discovered for all the ills to which "humanity is heir."

The power of alcohol to defer inanition, is made use of to prove its value as an article of diet. That it possesses this property is indisputable. Physiological chemistry has substantiated nothing more certainly than that small as well as large doses of alcohol diminish tissue change. Every product of the destructive metamorphosis of the system is decreased in amount by the ingestion of any alcoholic prepara-

tion. Less carbonic acid is thrown off by the lungs, less solid matter in the fæces, less urea, uric acid, and phosphates by the kidneys: the temperature of the body, that most accurate measure of vital activity, is reduced. Such prevention of waste necessarily postpones starvation. In shipwreck, a cask of brandy would doubtless protract life longer than the same quantity of water.

But how many in this country are unable to get enough to eat? The greater danger is of gormandizing. In those persons who have enough wholesome food, it is undesirable to lessen the moulting of the organism. Tissue change is a measure of vitality; vitality is a token of health. In a state of debility, the solid excreta of the system are diminished. In sleep, the temperature is half a degree lower than when awake. Is it, then, advisable to imbibe that which reduces the physical condition of daily life to the level of invalidism or torpidity?

On the other hand, the solid excreta of the robust and active man is greater than in the sedentary. Exercise or digestion raises the temperature, and augments the excretion of carbonic acid.

Here, then, an agent is recommended which prevents, to a greater or less degree, the normal manifestations of exalted animal life.

Water, on the contrary, like a true handmaid of nature, promotes the healthy metamorphosis of tissue—prevents, as it were, the clogging of the wheels within the complex machinery of the human body.

Whilst admitting that “alcohol adds no increment to the bulk of the tissues,” Anstie yet relates numerous cases, occurring in the practice of various English physicians, to prove that life has been maintained for a long period chiefly, or even wholly, upon spirituous beverages.

Not one of the very remarkable instances is perfectly substantiated; but he thinks there must be some truth in so much evidence. Perhaps the most wonderful example was a patient of Dr. Inman: “She was about twenty-five years of age, handsome, florid and embonpoint; of very active habits, yet withal of a delicate constitution.” “This lady had two large and healthy children in succession, whom she successfully nursed. On each occasion she became much exhausted, the appetite wholly failed, and she was compelled to live solely on bitter ale and brandy and water. On this regimen she kept up her good looks, her activity, and her nursing, and went on in this way for about twelve months.”

It is evident, as these physicians claim, that the moderate checking of destructive metamorphosis effected by alcohol, would not suffice to explain cases like this. It must be a direct nutriment. Indeed, if

these be facts, it is far superior, as a food, to all the hydrocarbons. Lehman undertook to live exclusively upon a diet of starch, sugar and oil. He became, in consequence, so ill, that at the end of three days he abandoned the experiment. Hammond made himself absolutely sick by ten days dieting upon starch and water. Such a result is not surprising, when we consider that five ounces of nitrogenous matter are excreted daily, and that consequently, at least a like quantity must be ingested, if the tissues remain intact. A non-nitrogenous diet, like alcohol or starch, by *a priori* reasoning, would be insufficient to maintain life. But if there is a substratum of truth in these extraordinary cases, and unless they be the kind of exceptions that do but prove the rule, it is an easy matter to put them to the test. Let Doctor Inman institute an experiment as to how long he himself can live solely upon alcoholic beverages. Only such proof will be convincing, for we are assured that the patients, whose cases they report, if put under strict surveillance, like the hysterical girl recently starved in England, would either eat or die.

As a proof that the special class now under consideration is alimentary, it is stated that there exists for it in man a natural appetite. That although there are individuals who abstain entirely from every form of stimulant, yet throughout the globe there is a general use of alcohol, opium, tea, coffee, tobacco, hasheesh, cocoa, or arsenic. The fact is acknowledged, but this is not the age to assert that all natural tendencies of imperfect humanity are right. On the contrary, the use of these stimulants is no more extensive than depravity. It is the mission of religion and civilization to do away with all manifestations of selfishness, whether of the appetite and passions, or of the heart.

In closing the consideration of alcohol, as belonging to a special class of accessory food, it is well to consider to what an acceptance of this theory logically leads. So far as we can distinguish, every argument in its favor applies to opium as well as to alcohol. If the one is of important dietary value, so is the other. Yet, to judge from the stringent legal regulation of the sale of opiates, and from the care of physicians in their administration, few hold the opinion that the seductive extract of poppy should be thrown open to general use.

The latest work on this theme is by Dr. Calkins, of New York, entitled "Opium, and the Opium Appetite." It probably embodies the opinion of the majority of the profession.

As a collection of facts, it certainly is worthy of all praise. The author arrives at the conclusion that opium eating is worse for men, but rather better for women, than drunkenness. He fears that the

practical effect of the disuse of alcoholic beverages will be to introduce as a substitute the more portable and degrading inebriant, morphia. He bewails the fanaticism that advocates total abstinence from alcohol, but of opium, he says, as a "deduction," in the last chapter of his book "Against the temptation to habitual use, neither individual constitution, nor social condition, provides any certain immunity." "In a practical view, it may be affirmed of the habit, that the same is virtually non-vincible." "Dosing, by gradual augmentations, is the normal course of experience."

These are words that apply to alcohol as well as to opium. If they be true, the cry of total abstinence cannot be pronounced absurd, until experience has shown that such a course is deteriorating to bodily health.

Thus far we have endeavored to show that there is insufficient reason to class alcohol with any sort of food. Now, there remains to be considered, its relation to drugs. In this it is not necessary to select the gentler agents of the *materia medica*, whose action is silent, and whose power for good or evil is scarcely determined. On the contrary, alcoholic liquids will bear comparison with the most potent medicines of pharmacy, such as prussic acid, belladonna and chloroform. Powerful neurotics usually enter the blood directly from the stomach, exert each its peculiar action upon the system, exercising, in an unexplained manner, an especial influence upon the nerves, and then pass out through the emunctories, leaving the body once more subject to normal agencies. Like German invaders on French soil, they bring new customs, overthrow the established order of things for a season, and then depart, leaving temporary disturbance behind, with perhaps an ultimate beneficial result. Now, it cannot be said that the whole of a dose of alcohol, or certain other nervines have been detected in the excretions. But it is true that the physiological action is temporary, and that at the end of a short time (not usually more than forty-eight hours) no trace of them can be discovered in the body. If the doses, however small, are so frequently repeated, that the blood is never free from their presence, an abnormal change is effected in the molecular constitution, either of the nerves or vital organs; also, in excessive doses they produce death. These are attributes which, as no words are required to show, belong to alcohol.

Without pursuing a general comparison further, let us observe more closely the resemblance of alcohol to a single admitted drug.

Ether might well be named Rapid Alcohol. The relationship in this case is genuine. The formula for ether is $C_4H_{10}O$; for

alcohol C. 4, H. 5 O., H. O. The one is oxyd of ethyle, the other hydrated oxyd of ethyle. The former is obtained from the latter, simply by the subtraction of one equivalent of water. Both are volatile, mobile liquids, of a penetrating odor, both combustible, readily evaporating, quite universally solvent. Their boiling points are low, viz: 95° and 172° F. Neither can be frozen by a temperature of 166° below zero. Both produce their effects when inhaled, as well as when administered internally. Of each, the primary action is stimulant, the secondary, anæsthetic. From the first introduction of etherization, Dr. Bigelow and others have remarked how precisely its different stages correspond to those of alcoholic intoxication. It is the same thing condensed into a shorter time; yet we have never heard it advanced that ether is an article of diet, and should be placed in the hands of the people for indiscriminate use.

Of the many who urge the value of alcohol, as a stimulant in health, we know not one who approves it as a narcotic. Anstie believes that its use in disease, even, should be limited to small doses, and that if the desired effect is not thus obtained, its administration is contra-indicated. Whilst unable to prove that small and large doses differ only in degree, we do assert that their action is not so directly opposite as has been described; but that on the contrary they are strikingly analogous. We know not that the experiments of Dr. Edward Smith have been disproved, from which he concluded that a minute quantity of spirits impairs the perceptive power of the special senses.

The first indications of narcosis, are flushing of the face, moisture of brow, or cerebral excitement, caused by paralysis of sympathetic or cerebral nerves.

But before any of these symptoms appear, a so called proper dose, it is said, produces a sense of warmth, at the epigastrium, and of universal comfort, allays hunger, relieves pain and wakefulness, checks excretion, and, unlike an intoxicating quantity, increases the force and rapidity of the heart's action, necessitates no reaction, calls for no subsequent increase.

It is well known that the first six in the above classification of effects, viz.: the causation of local and general comfort, the lessening of appetite, pain, insomnia, and excretions, are brought about, not only to an equal, but to a *greater* extent by large than small doses. It is a fact illustrated by every drunken spree.

As to the augmentation of the heart's activity, being evidence that stimulant and narcotic doses of neurotics are radically diverse, look at Anstie's own experiments. One drachm of ether raised his pulse from

74 to 88, whilst two and a half drachms (an intoxicating dose for him) carried it to 104 beats per minute. Indeed, all have witnessed in the production of anæsthesia, that pulsation is most rapid during the period of greatest excitement, when consciousness is nearly extinct.

Great stress is laid upon the idea that no reaction whatever follows the use of a mere stimulant. Certainly the recoil from a single glass of wine is seldom disagreeable. That it always, however, exists, we may infer from the fact of its severity in certain cases of idiosyncrasy, and because even the normal stimulation of a meal, or bath, is succeeded by moderate depression.

Lastly, it is asserted, that a purely stimulant use of any of this class, does not deprave the appetite, or lead to increase, either in the quantity or strength of the beverage.

This is another assumption, concerning which we appeal to experience for refutation.

I once advised a man subject to extreme cardiac pain to cease the use of tobacco. He was a habitual, but moderate user, rolling it as a sweet morsel under the tongue, rather than chewing it. The effect was merely a feeling of comfort. He gave it up for two weeks, substituting bark, liquorice, &c., in order that the mouth might feel its accustomed tenant. But the system could not be thus cheated. He was obliged to leave off work as a painter. The tremor of hand and disorder of mind completely unnerved him, nor could the brush be resumed till he had gone back to the tyrannical weed,—as much a victim of slavery as any treated of in “Uncle Tom’s Cabin.”

We are all familiar with the effect of opiates upon children under the guise of Mrs. Winslow’s Soothing Syrup, and other similar preparations. The result is an increase of dose from month to month, and continuous worrying when not under its influence.

It is to be observed, likewise, that those foreigners, resident in our country, who laud the sprightliness and temperance of Europeans, are themselves in love with the wine cup. They import largely for personal use, and feel lost without their habitual stimulus.

It is probable, as has been before stated, that a man can survive upon a less than average amount of food by the help of some of this liquid tissue preserver. But that moderate drinkers in our country take less food than abstainers, we would fain deny. Ales, wines, and whiskey are prescribed for want of appetite. Is it thought to increase the desire for food, and still have the patient eat less?

Those who "linger long at the table" are wine bibbers. It is this adventitious aid which enables them to digest five or six courses of richly served viands.

While bathing at Newport last summer, during the hour allotted to men, an opportunity was afforded for studying the anatomy of some of our moneyed aristocracy. We were surprised to see their stomachs so much larger than their heads. It suggested, in spite of our reverence for America's prominent men, porkers fatted for the market. While achieving their prosperity, they doubtless were not afflicted with hypertrophy of the stomach.

Finally, it is unfortunate for the theory that small doses are wholly beneficial, and large ones utterly detrimental, that Anstie's extraordinary instance of life, maintained by alcohol, with scarcely an exception, occur in downright toppers. The young woman, for example, whose case has been related, was several times on the verge of delirium tremens.

The facts collated in this paper indicate the true use of alcohol. It is a preservative of the tissues, not by supplying what they need, but by checking their waste. Its application, then, is to that emergency, when, from any cause, destruction is in excess of construction. Hence, its value in low forms of fever, when, as indicated by the high temperature and crowded emunctories, disorganization is taking place with dangerous rapidity; also, in those chronic affections in which emaciation is the prominent symptom. Finally, in those special cases, where even the most concentrated forms of food are rejected by the stomach, brandy may be retained, and temporarily suffice. When given under these circumstances, not an atom would we subtract from its fair fame.

Physicians, themselves, when requiring treatment, seek the advice of a brother practitioner. They know that a sick man, however skillful, is unable to judge correctly of his own case. But alcoholic liquors, classed among the most potent drugs of the *materia medica*, every man, however ignorant, may prescribe for himself. Is it strange that such self-made doctors often kill their patients?

The persons who enter upon the use of stimulants are not those who are afflicted with dyspepsia, whose circulation is sluggish, and who seem to require an extraneous aid to keep even with the duties of daily life. The habit is begun in the vigor of youth, when vitality is superabundant, when mince pie, cheese, and doughnuts can be eaten at bed-time with impunity, when ambition is exuberant, and hope is buoyant. At a period when judgment and experience alone are unde-

veloped, the young man is tempted on every hand to stimulate. The consequences may be read in the poverty and crime of Rhode Island.

We have shown that alcohol is not one of the essential foods; by comparison, that there is little physical or physiological resemblance between it and the hydro-carbon foods; whilst the relation between it and anæsthetic drugs is extremely intimate. That, as a member of a special class of aliments, it is only nutritious in the same sense as opium and arsenic. In fine, theoretically, there is reason why it should be subject to the same restrictions as other potent drugs. Is it not likewise true practically? If the beverages presented for public sale contained but two or three per cent. of alcohol, philanthropy might reserve its forces for greater evils. But the best wines in American market contain from twelve to twenty per cent. of alcohol, and the least hurtful adulteration to be hoped for is the increase of that proportion. Indeed, so soulless are the men who engage in this traffic, that no poison is too dangerous for them to make ready for the stomachs of their fellow men.

In consideration of the scientific facts known to the profession, and the daily effects known to all men, we believe it both a right and a duty to stop the sale of stimulating beverages by irresponsible persons, and to confine them to their proper place in the drug store.

THE CAUSATION OF TYPHOID FEVER.

BY

GEORGE E. WARING, JR.,

OF NEWPORT, R. I.,

The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 12, 1878, announced that they had awarded a premium of two hundred dollars for the best dissertation on The Causation of Typhoid Fever to an essay bearing the motto, "*Qui n'a santé n'a rien*;" and on breaking the seal of the accompanying packet they found the author to be George E. Waring, Jr., of Newport, R. I.

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THE CAUSATION OF TYPHOID FEVER.

The long-continued and somewhat thorough investigations of the ultimate methods of the causation of this disease have failed of a scientifically accurate result. The question whether typhoid fever always springs from the presence of specific poison produced by a parent case of the disease, or whether it may, under certain circumstances, arise *de novo*, is still in doubt. It is hardly worth while, in a paper prepared for the use of medical practitioners, to restate the facts and observations which support one or the other of these theories; this would lead only to the inconclusive result which has always thus far attended the discussion.

By far the majority seem to sustain the opinion of Dr. Budd and his followers, that the disease can originate only from the presence of a specific poison produced by a previously existing case. It should be remembered, however, that as most physiological investigators have confined their observations to dense communities, where the disease has prevailed, their observations are more or less clouded by the probability that previous cases have had an influence upon those under consideration.

Although their number is far smaller, other investigators have devoted themselves entirely to very sparsely settled districts, whose isolated families have so little communication with the rest of the world and with each other, that it is easy to determine the exact circumstances of contact. The occurrence of typhoid fever in a house standing miles away from all others, where it is rare that any member of the family goes from home, and where a visitor as rarely comes, furnishes strong presumptive evidence of the correctness of Dr. Murchison's theory of a possible *de novo* origin.

To show the testimony upon which opinions are based, we may cite the instances described in various reports of the Massachusetts State Board of Health. In that State the annual deaths from this disease are about one in one thousand, and it is estimated that one-tenth of the cases are fatal; so that about one per cent. of the population are attacked by the disease. There, as elsewhere, typhoid is peculiarly a disease of the country rather than of the town. The observations of ten years show that among a population of 1,044,294 persons, living in large towns, the typhoid death-rate was 0.755; and that among a population of 213,468 persons, living in small towns, the rate was 1.189.

The case is reported of a house in Hadley, built by a clergyman, where a well existed in the cellar into which foul air from the sink drain had access. Vegetables were kept in the cellar; the windows were never taken out; there was no escape for the foul, damp air; and water stood in drops upon the ceiling and walls.

“After a few months’ residence in the house the minister’s wife died, of fever, so far as I can learn. He soon married again, and within one year of the death of the first wife the second died, from, as I understand, the same disease. The children were also sick. He lived in the house about two years. The next occupant was a man named B—. His wife was desperately sick. A physician then took the house. He married, and his wife died of the fever. Another physician was the next tenant, and he, within a few months, came near dying of erysipelas. All this while matters had remained as before described with reference to ventilation. A school-teacher then rented the house, and tore up the closed box, but did not cover the well. This was about eight years after building the house. The sickness and fatality were so marked that the property became unsaleable. When last sold every sort of prediction was made with reference to the risks of occupancy, but, by a thorough attention to sanitary conditions, no such risks have been encountered.”

The case of the Maplewood school, at Pittsfield, fully and thoroughly reported upon by Drs. Palmer, Ford, and Earle, is too well known to be detailed here. Of seventy-four resident pupils, sixty-six had illness of some sort; fifty-one had well-marked typhoid fever. Of the whole family of one hundred and twelve persons, fifty-six had typhoid fever, and sixteen of these died. The cellar was used for storing vegetables; the privy vault communicated with the main hall of the building; the kitchen drain discharged near by; the privy vaults were filled nearly to the surface; and, in the summer season, the house was pervaded by

foul odors. The school was dismissed; the sanitary condition of the establishment was thoroughly improved, and the institution became and has continued free from disease.

In a boy's school in Pittsfield the well stood under the wash-house, and was fouled by its leaking drain. Coinciding with this condition there was a serious outbreak of typhoid. The well being closed, and the water supply being taken from another source, the fever subsided. In another instance, men engaged in draining a meadow drank from a well supplied only from the water of the meadow, and were attacked under circumstances which seemed to connect the disease with the drinking of this water. In another an attack followed the drinking of water from a sluggish brook fouled by town sewage.

Evidence is given in these reports of outbreaks which were traceable to the tainting of an air-box, which supplied a furnace, by exhalation from the house drain; by the draining of a mill-pond which contained *no* sewage matters; and by the proximity of a stagnant ditch which had no obvious source of excrementitious fouling.

In Sutton an outbreak of typhoid coincided with the flow of barn-yard waste into a well three rods distant on the occasion of a sudden thaw.

The correspondent from the town of Oxford says: "So firm is my belief of this [referring to exhalations from foul drains, cellars, privies, and pig-sties] as a cause of typhoid fever, that when I meet with a case of typhoid fever, not readily traceable to some of these causes, I infer that the truth has not been told me, or that my perceptive faculties have been at fault."

At Martha's Vineyard and in Newton there seems to be evidence that the prevalence of typhoid is effected by geological conditions, clay subsoil or underlying rock covered with rich soil favoring the disease. The very local character of most epidemics indicates defects of soil rather than of air. A physician in Pittsfield reports four cases and one death occurring among charcoal burners occupying two houses standing high up on the mountain side, and supplied with pure spring water. The first case had been exposed to no other than local agencies. The house was built into the hill-side, and on its upper side there was a foul pool of house-slops standing several feet higher than the level of the floor. This seemed to have caused the first attack of the disease, which subsequently extended to the other house, there being frequent communication between the two. The outbreak took place in August, when the windows overlooking this foul water were probably kept open.

At Coltsville, slops were thrown out near the well, and a foul barn-yard pool stood near it. The condition of the well was the only traceable cause of the disease which followed. In another case the fever occurred after the use of water from a well near a barn-yard. Indeed, in all of the records of typhoid investigations, here and abroad, there appear innumerable instances where drinking-water wells were contaminated by infiltrations from manure heaps, swill, slops, cesspools, and privy vaults. In other cases, where there has been no conspicuous contamination of the drinking-water, outbreaks of the disease have coincided with the emptying of mill-ponds for the purpose of repairing the dams. Again, the infection of well-water by the infiltration of soap-suds in which the clothing of fever patients had been washed seems to have caused an outbreak.

One of the most striking examples of investigation of the ætiology of typhoid fever occurring in very sparsely settled districts is to be found in a paper by Dr. W. H. Bramblett, of Newberne, Va., published in the *Virginia Medical Monthly*, May, 1877, page 109. Dr. Bramblett practices along both sides of New River, which flows through a mountainous country broken into numerous valleys and gorges. There are no ponds or marshes whatever, and the elevation is from twenty-two hundred to twenty-five hundred feet above the sea. His investigations lead him to the belief that typhoid fever may originate without the least possible connection with a previous case. He cites seventeen cases, which had seven distinct starting-points, entirely unconnected with one another and with any other traceable source of contagium. The drinking-water seems to have been always pure, mountain-spring water; the privies appear to have been well placed with respect to the house; and, so far as can be gathered from Dr. Bramblett's report, there was an entire absence of all of the conditions which usually attend outbreaks of this disease. The description of symptoms indicates that the cases were all true typhoid fever. Among his conclusions Dr. Bramblett suggests the following: that "typhoid fever often originates spontaneously," or that "the contagium to which the disease owes its specific character originates *de novo*."

In estimating the value of this report it is to be considered that the reporter believes typhoid fever to be directly contagious,—a conclusion diametrically opposed to the recorded observations of those who have had experience in great fever hospitals.

While the voluminous records of investigation as to the origin of typhoid fever fail utterly to decide the question between those who do and those who do not, believe that it can originate *de novo*, and while

they leave in doubt the question between "living germ" and "specific poison,"—while, in other words, they leave the purely scientific problem still unsolved,—they are full of instruction as to the causation of the disease as we almost uniformly know it in practice. From the point of view of the medical practitioner, although much is still to be learned, we already know enough for the complete stamping out of typhoid fever as an epidemic. Sporadic cases may still occur, but if the physician knows what he may now learn, if he is energetic in the performance of his duty, and if he is sustained by private opinion and by public authority, he may, in every instance, prevent the extension of the disease to a second subject. Practically, so far as the health of the public is concerned, we may be said to possess already very nearly all the knowledge that we need.

There is no longer any dispute concerning the chief vehicles by which the specific contagium of typhoid fever is conveyed. These are the air that we breathe and the liquids that we drink. Perhaps we may narrow the question still more, and ascribe to the action of the air only the indirect conveyance of the contagium to the stomach; for there are indications that as the contagium of typhoid fever proceeds from disorders of the alimentary canal, so it is only the surfaces of the alimentary canal which are susceptible to its attack.

The poison of the air may be direct or indirect. That is, it may be due to the exhalations of decomposing matters in dung-heaps, pig-sties, privy vaults, cellars, cess-pools, drains, and sewers; or it may be due (according to Pettenkofer) to the development of the poison deep in the ground, and its escape in an active condition in ground exhalations. The water, milk, etc., which we drink may be contaminated by the absorption of foul odors from air with which they are in contact, or by the direct admixture of organic matters bearing the elements of infection. There is such a multitude of possible sources and channels by which the infection may be brought to us that it is often almost impossible, in first cases, to determine which has been actually in operation; but the original case being established, it becomes comparatively easy to trace the channel of its influence in the production of further cases.

It is with these well-known and clearly traceable agencies of development and communication, by which the initial causation is favored and the extension of the disease insured, that the practicing physician and the health officer have chiefly to do. If it is true that prevention is better than cure, then it should be the first care of the physician to insure the absence of all conditions which do or may favor the origin and spread of the disease.

Typhoid fever has in this connection an especial importance, not only as being a wide-spread scourge of almost unequalled magnitude, but as being the typical "pythogenic" disease. Its development and extension are due to conditions which equally promote the spread of diphtheria, diarrhoea, dysentery, cerebro-spinal meningitis, scarlet fever, and the long list of minor ailments which, without destroying life, make living almost worthless,—diseases which undermine happiness, sap the springs of energy, and overwhelm the patient with listlessness and *ennui*. It is the best known and the most widely spread of the long list of preventable diseases: and as the circumstances which favor the extension and aggravate the character of the whole of these are those which have the strongest influence over itself, so by removing the conditions which foster them we shall do much to restrict its contagion.

All the learning of the ages has taught us no better formula to express a perfect sanitary environment than the old one of Hippocrates: "Pure air, pure water, and a pure soil."

If we would turn typhoid from our doors, and literally stamp it out as an epidemic, we need only to insure this condition in its integrity. We may still import single cases from less cleanly neighborhoods, but it will be our fault if we permit it to attack even one of our own community.

Turning now to the practical bearings of the question, we may safely assume that typhoid fever is not conveyed by simple personal contact with the diseased body. According to Dr. Murchison, in the London Fever Hospital, where two thousand five hundred and six cases of typhoid fever were treated in fourteen and one-half years, there occurred during the whole time only eight cases which originated in the hospital. Other instances are almost as striking, and in some cases the disease originated in isolated wards, such as small-pox wards, where personal contact was impossible, but where a conveyance of the infection by drains, air channels, etc., was clearly detected.

It may doubtless be assumed that the agency in the spreading of the disease from an original case exists entirely in the dejections from the bowels. Dr. Budd thinks that the surface of the bowels throws off the specific poison, as the surface of the skin throws off the poison of other diseases. The infecting material, whatever may be its character, is believed never to be active until it has undergone a certain development in connection with subsequent fermentation or decomposition of the dejections. Its vitality is very great, and seems little dependent upon circumstances other than the effect of a very high temperature. Dr. J. M. Lazzell, in the Transactions of the Medical Society of West

Virginia for 1877, publishes a paper on the contagiousness of typhoid fever, in which he describes an outbreak in the family of one Thomas, which in time produced such terror that no nurse or washer-woman could be induced to come to the house. The bed linen and clothing, soiled with typhoid dejections, were boxed up and packed away. Three months after the disease had disappeared from the country, and when the general health was good, a girl came from six miles distant to do the house-work. Among other things she washed this boxed-up clothing. In ten or twelve days she was taken sick, and went home. Dr. Lazzell was called to her five days later, and recognized the same form of typhoid fever that had occurred in the Thomas family. Eleven members of her household were exposed, and eight of them took the disease. It did not attack a single person not so exposed.

The evidence is copious and conclusive that typhoid infection is transmitted often to a long distance, and after the lapse of considerable time, by running water to which the dejections have obtained access.

In Wicken Bonant the stools of a typhoid patient were thrown into a vault which stood near to the edge of a brook thirty-five yards above the parish well. The water-course carried the infection to the well. Forty-five cases occurred: five of them among one hundred and eighteen persons who did not drink the water from the well, and the remaining forty among eighty-eight persons who had no other source of water supply. That is to say, of those who used the water from the parish well forty-six per cent. were attacked, and among those obtaining water from other sources less than three per cent. were attacked. This statement is taken from the twelfth report of the medical officer of the privy council of England.

I have previously cited the case of the outbreak at Over Darwen, in England, as follows:

“There has recently been an investigation into the origin of an outbreak of ‘filth fever’ in Over Darwen, England, the origin of which for a long time eluded the careful search of the authorities. It was finally worked out by a sanitary officer sent from London. The first case was an imported one, occurring in a house at a considerable distance from the town. The patient had contracted the disease, came home and died with it. On first inquiry it was stated that the town derived its water supply from a distance, and that the water was brought by covered channels, and could not possibly have been polluted by the excreta from this case. Further examination showed that the drain of the closet into which the excreta of this patient were passed emptied itself through channels used for the irrigation of a neighboring field.

The water-main of the town passed through this field, and, although special precautions had been taken to prevent any infiltration of sewage into the main, it was found that the concrete had sprung a leak and allowed the contents of the drain to be sucked freely into the water-pipe. The poison was regularly thrown down the drain, and as regularly passed into the water-main of the town. This outbreak had a ferocity that attracted universal attention; within a very short period two thousand and thirty-five people were attacked, and one hundred and four died."

Liebermeister says that typhoid dejections, conveyed in night-soil spread as manure upon the gathering ground of an aqueduct, so contaminated the water supply as to produce an epidemic of typhoid fever among the population using the water.

Similar instances might be cited almost without number. Indeed, there is among investigators no difference of opinion as to the communication of the disease by means of drinking-water thus polluted. There are many instances recorded of the contamination of the water of wells by the transmission of fecal matters through the soil from adjacent privy vaults and cess-pools. One of the most striking of these is that of an outbreak in the village of New Boston, in Erie County, N. Y., in 1843, investigated and reported upon by Dr. Austin Flint, Sr. From its early date this case is worthy of description here. No case of typhoid fever had ever been known in the county. The community numbered forty-three persons; twenty-eight of these were attacked with fever, and ten died. All of those affected obtained their drinking-water from a well adjoining the tavern; but one family, living in the midst of the infected neighborhood, owing to a feud with the tavern-keeper, did not drink this water, and escaped infection. Two families lived too far away to use this well. This immunity on the part of the enemy of the tavern-keeper led to a charge that he had maliciously poisoned the well,—a charge which resulted in a suit for slander and the payment of one hundred dollar damages. At that time the idea that typhoid fever might be communicated by infected drinking-water had not been advanced; but its truth receives strong confirmation from the fact that a passenger, coming from a town in Massachusetts, where typhoid prevailed, and traveling westward in a stage-coach, having been taken ill, was obliged to stop at this tavern. Twenty-eight days after his arrival he died of typhoid fever, and thus, doubtless, transmitted in some way to the water of this well the germs of the disease, which speedily attacked every family in the town except the three which did not resort to it for their supply.

Not only does water itself serve as the direct vehicle of contagion, but it has in several striking instances, caused the serious contamination of milk which had been directly diluted by it, or which had been stored or carried in vessels washed with it. The most noteworthy of the reported cases of this character is that of an outbreak in Marylebone and the adjoining parts of London, reported by Radcliffe in the second number of the new series of reports of the medical officer of the privy council. Two hundred and forty-four cases were distributed through one hundred and forty-three households. There was at that time no corresponding increase in neighboring districts, and the metropolis generally was unusually free from typhoid. The conclusions arrived at were the following: (1) the outbreak was caused by milk infected with enteric fever material; (2) this milk came from a particular farm; (3) the water used for dairy purposes on this farm contained excremental matters from a patient suffering from enteric fever immediately before and at the time of the outbreak. Of one hundred and ninety-one cases occurring in nine weeks, one hundred and sixty-seven were in households taking this milk, and only twenty-four in households not taking it.

All evidence points to the long vitality of the infecting material, which lies dormant at times for many months, and then, under favorable circumstances, acts with violence.

Not only does the infection follow the course of water to which it has gained access, or find its means of dissemination in the exhalations of decomposing filth, and thus contaminate the air which we breathe, but these exhalations are readily absorbed by water, which is capable of holding the poison, to the detriment of those who may drink it, and of transmitting it again to air with which it may be in contact. Many cases have been reported similar to that cited by Dr. Carpenter, health officer of Croydon, who traced the origin of an outbreak to the drinking of water from a house cistern, to which air from the public sewer had been led by the pipe serving as an overflow for the cistern.

Especial danger attaches to the use of water-traps, or water held in the bends of waste-pipes, soil-pipes, etc., when these are the only barrier between the interior of the house and a sewer or cess-pool containing typhoid dejections. The retained water absorbs the poison at its outer or sewer end, becomes saturated with it, and gives it off to the air in the house end of the pipe.

The conclusion from the foregoing is clearly this: that the dejections of typhoid patients are always to be regarded as dangerous material, capable of developing and spreading the fatal infection under a great

variety of conditions: that the only sure means for preventing the spread of the disease must be sought either in the speedy, complete, and distant removal of the material, or in its complete disinfection. If to be retained in the vicinity of human habitations, it must be disinfected, or subjected to decomposition, under such conditions that its poisonous material shall be destroyed: if to be removed, it must be removed to a point beyond the reach of the community, and to a point where it can in no wise contaminate the source from which drinking-water is taken.

The contagium of typhoid fever is not a poison in the sense in which strychnine and arsenic are poisons,—attacking alike each body into which it may be introduced,—but, like the contagium of other diseases of its class, it depends upon a certain condition of susceptibility on the part of the subject. This infection, like many others, is inoperative except upon a system prepared to receive it. In other words, we must have not only the seed but also the soil. In discussing the causation of this disease with the practical object of seeking the means for its prevention, we have to regard not only the source of the contagium, the vehicles of its transmission, and the method of its attack, but in almost equal degree those influences which tend to dispose the human body to succumb. This double condition (that there must be, if not absolutely always, at least very generally, an actual element of contagion, whether germ or specific poison, and also that there must be a state of susceptibility on the part of the subject) greatly improves our chances of success in contending with the disease. We know where the morbid material resides, and so are enabled to avert its approach; and, on the other hand, we know what conditions of living induce the susceptibility, and so have it in our hands, by improving these conditions, to increase the power of resistance.

So far as the prevention of typhoid fever is concerned, aside from tonic medication, the means to be employed are of a purely hygienic character; it is a question of the skill of the practitioner as a sanitarian rather than as a physician. He has two objects to attain; first, the removal of the infecting cause; second, the provision of healthful conditions of living. If the theory is correct that, as Dr. Murchison supposes, typhoid fever may originate *de novo* from the decomposition of organic matter, then the two objects are to a certain extent blended, in so far as atmospheric conditions, which might induce susceptibility, are also capable of causing the disease. In effect, our practice will be safely guided if we regard the two objects as separate and distinct.

Starting with the proposition that typhoid fever is produced only by

the operation of a specific cause borne in the dejections of typhoid patients; that it is innocuous when first voided, but becomes active after a certain exposure in the decomposing fæces; that it has great vitality; that it is capable of being carried by flowing water, by water percolating through the earth, and by the vapor of water floating in the air; that it may be absorbed and retained and exhaled by water; and that it may be retained, developed, and transported by clothing and other articles soiled by its medium, we see that the greatest possible vigilance and the most skillful care are to be applied to the treatment of typhoid dejections. Some of the experiences of England indicate the truth of the statement of the Rivers Pollution Commissioners, that so far as the cause of infection is concerned "filters do not filter and disinfectants do not disinfect." It will at least be safe to assume that in the case of water-carriage the immediate distant removal and the most complete atmospheric exposure are much more effective than any treatment of sewage by the usual methods of filtration; also, that any attempt at chemical disinfection must be more than ordinarily thorough. There is reason to suppose—reason almost sufficient to secure reliability—that the poisonous element is developed and made effective only when the decomposition of the fæces containing it takes place in the absence of a supply of fresh air sufficient to carry it on in the most rapid and healthy way. In other words, active oxidation, whether produced by oxidizing disinfectants, by the operation of atmospheric oxygen, or by the intensified oxidizing power of the contained gases of porous material, seems to prevent decomposing fæces from assuming a condition favorable to the development of infection. The evidence in support of this theory is of course of a negative character, but it is extensive, and, so far as the writer knows, it is accepted by leading physiologists.

Typhoid fever is not produced by exhalations from the surface of lands irrigated with the discharge of such sewers as have a rapid and continuous flow, and thereby deliver all they receive before it has had time to undergo decomposition. There is no evidence that typhoid fever is caused by the contained air of thoroughly ventilated soil-pipes. The most active professional enemies of the earth-closet system have never adduced an instance where typhoid fever, or any other cognate disease, has followed its well-regulated use. In *The Lancet* of March 6, 1869, Professor Rolleston, setting forth his objections to the earth-closet, said: "If I am told that the earth-closet is inoffensive, and that the privy is foetid, I answer that a rattlesnake is none the less

dangerous because its rattle is removed; and that, for anything shown or known to the contrary, odor is to infection, deodorization to disinfection, what the noise of the serpent is to its bite." It is nine years since this was written, and amid all the voluminous reports upon the dry-earth system there is no word to sustain Dr. Rolleston's fears. On the other hand, together with much else of similar purport, the evidence of Dr. Monat reports that in those jails of India where the earth system is used, even at the time of the most serious cholera epidemics, this disease, which is so like typhoid in its mode of transmission, never gains a foothold. One would almost be justified in replying to Professor Rolleston, that it is not a question of removing the rattle, but of killing the snake. Investigations made to determine the manurial value of closet earth used many times over indicate a total and absolute destruction, not only of the odor but of the whole combustible material of the added fæces. The result has shown as complete destruction as would attend burning in a furnace.

This destructive oxidation depends upon the well-known concentration upon the surfaces of the interior particles of aerated porous substances. The intensity of the action is in proportion to the fineness of the material, or, in other words, to the total area of its interior surface.

It is perhaps not safe to assume that, in dealing with such dangerous material as typhoid excreta, treatment with dry earth, or ashes, or charcoal will suffice to render it harmless, but it will be more effective in this direction than anything else of which we have knowledge, and will at least prepare it for safe removal.

The physician in considering the treatment of the material in question has one of two sets of conditions to deal with. The fæcal wastes of the household which he is attending are either removed by water-carriage, or thrown into privy vaults. If by water-carriage, they are delivered into a public sewer or into a cess-pool. Sewers, as they usually exist, and cess-pools always and invariably, are so circumstanced as to favor the thorough development and multiplication of the morbid material under consideration. Unfortunately, sewers and cess-pools are so connected with the interiors of houses, with others as well as with that where the disease originated, as to make them too often the means for converting a sporadic case into a centre of infection. Even the house drains and soil-pipes through which the excrement passes on its way to the cess-pool or sewer are very generally as bad as these final receptacles themselves, while almost always the only barrier to the free return of their air and its poisonous freight into our very living rooms is the

water retained by a depression in the pipe (the trap), which water constantly absorbs and transmits the gases presented to it.

Where these water barriers are supplemented with one of the many mechanical check valves recently introduced, this means for the return of the infection is shut off. Where the soil-pipe and drain are freely open at both ends for the transmission of a current of atmospheric air, the danger of the development of the poison is greatly reduced, if not entirely removed. But even here, although we may feel secure so far as the immediate household in question is concerned, it is to be remembered that, at least in the case of a public sewer and of a cess-pool common to several houses, the matter deposited may produce its injurious effect in other families which are less well protected against it. Even where the cess-pool is connected with one house only, to permit the specific poison of typhoid fever to enter it and to spread itself through its accumulated filth is to incur a danger akin to that of establishing a gunpowder vault in one's back yard.

When infected fæces are to be thrown into a water-closet or drain, they should at least be treated with the strongest and most destructive chemical disinfectants, carbolic acid being by no means sufficiently so.

When the fæces of the household are received in a privy vault, it must be accepted as an imperative rule that typhoid dejections must never, under any circumstances, find access to this. Abundant and conclusive evidence shows that such accumulations of fæces only await the introduction of the least germ of any diarrhœal disease to become by means of their exhalations and of their pollutions of the soil, active agencies of development.

Even when the earth-closet system is employed, none of the regular apparatus should be used by the patient, or become the receptacle of his dejections; this for the simple reason that it should be our first object to secure the most complete isolation of the tainted matter from every substance which might foster the increase of its tainting element.

It would be better, perhaps, to stop with this general statement of principles, leaving each practitioner to apply them according to his judgment, but one is tempted to recommend what one believes to be the most efficient process, and I therefore take the liberty of suggesting that a chamber or bed-pan, filled to the depth of an inch with dry earth, or with sifted anthracite ashes, or with powdered charcoal, be used to receive the evacuation; that this be immediately covered with a further inch in depth of dry material, and that the whole be turned into a *shallow* hole in the ground and covered with earth not more than two inches deep, so that it may go through with its decomposition in the upper

soil within easy reach of the oxidizing air. If to be removed quite away from the premises, the earth containing the dejections may be thrown into a barrel or box, each deposit being covered with fresh earth, and *carefully protected against rain*.

It would be out of place here to enter into all the details of the hygienic law. In a paper written for the profession this would be, too, a work of supererogation. At the same time it may be advisable, in this connection, to refer briefly to the manner in which, and the degree to which, the general health is influenced by exhalations from decomposing organic matters in sewers, house-drains, vaults, cess-pools, and cellars. It must have been the frequent experience of all physicians that every question as to the tainting of the air of a house from these sources is met by the assertion that no bad smell has ever been perceived. In the first place, the accustomed nostril is dull to detect a constant odor, and in the next it is hard to make people believe that, where they can smell no offense, there still may be danger. We ourselves know that the juices of the cadaver are most fatally dangerous before offensive decomposition has set in. Those who have given attention to the influence of drain-air in causing disease know very well that the action of this upon the health bears no relation to the intensity of its accompanying odors.

The only safety is to be sought in the absolute freedom of the air that is breathed, and of the water that is drunk, from every species of contamination due either directly or indirectly to organic decomposition. A little rift in the waste-pipe of a wash basin, so slight as to be detected only by the application of tissue-paper, has kept a whole family miserable and complaining, and susceptible to every species of contagion, for years together. Decaying vegetables in a cellar, and decaying filth in the waste-pipe of a kitchen sink, may be regarded as the bane of the existence of half the women in America. Those more serious defects which come of ignorantly arranged plumbing work—by no means of good plumbing work, which is the sanitarian's best aid—are responsible not only for most of the zymotic diseases appearing in the better class of houses, but in like degree for the generally ailing condition of so many of those who pass most of their days and nights in these houses.

The regulation of all these helps to healthfulness is a matter of detail which may well engage the best attention of the profession. Even the cataloguing and classification of the subject here would be impossible. The fundamental principle should always be borne in mind that neither in a sewer, nor in a cess-pool, nor in a house-drain, nor in a soil-

pipe, nor in the smallest waste-pipe should decomposition be allowed to proceed without such an abundant presence of fresh air as will secure its most rapid and complete progress. The same condition of obstructed decomposition which fosters the development of infecting agencies is precisely that which leads to a generally unwholesome and debilitating atmosphere. All investigation of this subject, and all discussion of the *modus operandi* by which unwholesome influences lead to the spread of epidemic diseases and to the lowering of the general health, bring us at the end to the firm belief in the principle covered by Hippocrates' prescription: "Pure air, pure water, and a pure soil."

APPENDIX.

LAWS OF RHODE ISLAND.

IN RELATION TO THE PUBLIC HEALTH, AND THE DUTIES OF THE STATE BOARD OF HEALTH.

GENERAL STATUTES.

CHAPTER 72.

SECTION 1. If nuisances or other causes injurious to the health of the inhabitants of any town, shall not be removed by the person permitting or erecting the same, pursuant to any order or regulation of the town council of the town, the town council shall thereupon adopt such measures as they shall deem effectual for the removal of such nuisances, or other causes injurious to the health of the inhabitants as aforesaid, at the proper charge and expense of the person erecting or permitting the same.

SEC. 2. The sheriff, his deputies, and the town sergeants and constables of the several towns, shall execute all such precepts and orders as shall be to them directed by said town councils, for carrying into execution the provisions of the section next preceding.

SEC. 3. The town councils of the several towns may designate and establish the place or places where the business of slaughtering cattle and other animals shall be carried on, which designation shall vest in the occupant or owner thereof a right to the use and occupancy of said place or places for the purposes aforesaid, until the same be withdrawn or suspended in the manner hereinafter provided, or until the same shall have been abated as a public nuisance.

SEC. 4. Whenever, in the judgment of the town council of any town, the convenience or health of said town requires that the right of slaughtering, as provided in the section next preceding, should be withdrawn or suspended, the said town council may suspend or withdraw said right, first giving to the owner or occupant of such place or places two months' notice, in writing, of the intention to suspend or withdraw the same.

SEC. 5. Every person who shall, after such notice has been given as aforesaid, commence or continue to exercise or carry on the business of slaughtering cattle or other animals, in such place or places, shall be fined fifty dollars for every day during which he shall continue to exercise or carry on the business aforesaid.

SEC. 6. In case of the suspension or withdrawal by any town council of the said right to slaughter cattle or other animals, the said town shall be liable to the person to whom such right has been granted, for any loss or damage consequent upon the withdrawal or suspension of said right, by any town council, to be recovered at a special court of common pleas, in the manner provided by law for cases within the jurisdiction of said court.

SEC. 7. Whenever the town council of any town shall have designated and established therein a place in which the business of boiling bones, depositing filth, keeping swine, or slaughtering cattle or other animals, may be carried on, as herein provided, every person who shall carry on such business in any other place, shall be fined fifty dollars for each day in which he shall carry on the same.

SEC. 8. Nothing herein contained shall be construed to deprive any farmer, not engaged or concerned in the business of slaughtering cattle or other animals, from erecting or continuing to use any building on his premises, for the purpose of slaughtering his own cattle or other animals, from time to time, as before accustomed to do.

SEC. 9. No person shall carry on the business of expressing oil from fish within any town, but at a place within such town to be designated by the town council thereof.

SEC. 10. Every person violating the provisions of the preceding section, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

SEC. 11. Town councils of the several towns may prohibit burials in the compact or thickly populated parts of any town, and may make such by-laws and ordinances relating to the same, and the use of grounds for burials in such localities, as they may think necessary for preserving the health of such neighborhood, and may enforce such ordinances in the manner provided in the first and second sections of this chapter.

SEC. 12. The provisions of the third, fourth, fifth and sixth sections of this chapter shall extend to the place of any manufacture of, or of working in, any article or substance, the manufacture of which shall not be deleterious to the health of the neighborhood: *Provided*, that prior to any action of the town council under this section, public notice of the pendency of any petition therefor shall be given, in such mode, and for such time, as said council shall prescribe.

SEC. 13. The town councils of the several towns may make such rules and regulations as they shall deem necessary, to regulate and control the construction and location of all places for keeping swine, privy vaults, sinks, sink-drains, sink-spouts, cess-pools, and the outlets thereof, and may provide for the summary removal or reconstruction of all such as shall be by them deemed prejudicial to the public health, and may make rules prescribing the location of stables, and the time and manner of removing manure therefrom, or from privy-vaults or slaughter-houses, and for the driving of animals through the highways of their several towns; and every person violating any ordinance, rule, or regulation, made in pursuance of this section, shall be fined twenty dollars, to be recovered upon complaint and warrant before any justice court, to and for the use of the town wherein such violation shall occur.

CHAPTER 74.

OF REGULATIONS FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES.

SECTION 1. Every commander of any vessel which shall come into any port or harbor of this State, and shall have any person on board sick of the small-pox or any contagious or infectious distemper, or which has had any person sick of such distemper in the passage, or which shall come from any port or place usually infected with the small-pox, or where any other contagious or infectious distemper is prevalent, who shall bring such vessel to anchor in any of the ports of this State within the distance of one mile of any public ferry, pier, or landing-place, or permit or suffer any person on board such vessel to be landed, or any person to come on board such vessel, without a license first had and obtained from the town council of such town where such vessel shall arrive, shall be fined four hundred dollars.

SEC. 2. Such commander, on his first arrival in any port in this State, shall hoist and keep his colors in the shrouds of such vessel, as a signal of having come from any such infected place, or having infection or contagion on board.

SEC. 3. If any person shall come on shore from on board such vessel, without license first had and obtained as aforesaid, the town council may send back such offender immediately on board such vessel, or confine him on shore in such convenient place as to them shall appear most effectual to prevent the spreading of any infection; and the person so offending shall satisfy and pay all charges that shall arise thereon, and shall also be fined forty dollars.

SEC. 4. The town council of the town where such vessel shall arrive shall send a physician, or other suitable person, to examine into and make report to them of the true state of such vessel and the people on board, at the charge of the master or owner of such vessel; and they shall forthwith put on board such vessel some suitable person or persons to secure said vessel, and effectually prevent any communication therewith, at the like charge of the master or owner thereof.

SEC. 5. The town council of such town shall confine on board such vessel, or send to some hospital, or other suitable place, all persons who came in said vessel, for a convenient time, until such of them as have, or are liable to have, the small-pox or other infectious or contagious distemper, are perfectly recovered and cleansed from said distemper, or have passed a suitable quarantine; and also all persons who have gone on board said vessel without license as aforesaid, at the charge and expense of such persons respectively.

SEC. 6. The town council of such town shall appoint suitable persons to take effectual care that all goods, wares, and merchandise imported in such vessel, which they think liable to hold and communicate the infection or contagion, are landed in some suitable place to be appointed by such council, and cleansed in the manner by them directed, before they are permitted to be brought into any house, shop, or warehouse, other than where they are cleansed as aforesaid.

SEC. 7. Whenever such goods are sufficiently aired and cleansed, said persons shall give the owners or possessors thereof a certificate to that effect; and the town council shall allow and order said goods, wares, and merchandise, to be

delivered to the owners thereof; and the charge and expense of airing, landing, and cleansing such goods, wares, and merchandise, shall be borne by the respective owners; and such charge shall be a lien on such goods, wares, and merchandise.

SEC. 8. All goods that are judged by the town council not to be infected shall be delivered to the owners without delay and expense of airing, and as soon as may be consistent with the safety of the town in regard to other parts of the cargo; and all goods, wares, and merchandise, imported into any town by land from any place infected with the small-pox, or other contagious or infectious distemper, shall be aired and cleansed at the discretion of the town council of such town, and at the expense of the owners thereof as aforesaid, or destroyed if necessary.

SEC. 9. All goods imported in such vessel as aforesaid, that shall be clandestinely landed or brought into any house, shop, or warehouse, without a certificate and allowance as aforesaid, or that shall be imported by land as aforesaid, and not cleansed or aired by order of the town council as aforesaid, shall be forfeited; one-third to the use of the State, and the other two-thirds to the use of the person who shall sue for the same.

SEC. 10. The town councils of the respective towns shall fix, settle, and adjust all wages and charges demanded by persons employed by them, to secure such vessel, or to air and cleanse such goods, or to attend upon and nurse such persons as aforesaid.

SEC. 11. If any owner, freighter, mariner, or passenger, as aforesaid, shall refuse to pay such wages and charges so settled, adjusted, and fixed, then the town treasurer of such town shall sue for and recover such wages and charges, and the court where such action is brought shall tax double costs for the plaintiff, if he recover in his said action.

SEC. 12. Whenever the small-pox, or any other infectious or contagious distemper, shall be prevalent in any place or town, all persons who shall come from any such infected place or town into this State by land, before the expiration of ten days after they shall have left such infected place or town, shall be fined not exceeding one hundred dollars, nor less than ten dollars.

SEC. 13. The town council in any town may appoint proper persons at all ferries or places that to them may seem necessary, to examine on oath all persons suspected of violating the provisions of the section next preceding, and on reasonable cause of suspicion, may bring such offenders before some magistrate, that they may be dealt with according to law.

SEC. 14. Every householder or person shall immediately inform the town council of the town wherein he dwells, of any person in the house or tenement occupied by him, who has been taken sick of the small-pox, or any other contagious or infectious distemper, or suspected to be so.

SEC. 15. Every person violating any provision of the section next preceding, shall forfeit twenty dollars to the use of the town, to be sued for in the name of the town treasurer.

SEC. 16. Whenever the town council shall be so notified, they shall make proper examination by some physician or other skilful person; and if it be the small-pox, or other contagious or infectious distemper, wherewith such person is sick, they shall immediately set a proper guard to prevent the spreading of the contagion or infection, and shall remove said person to any such place in the

town as they shall think the most proper to prevent the spreading of the infection or contagion, or continue the said guard as aforesaid, according as to them shall seem necessary; and likewise they shall confine all such persons as may be by them suspected of having taken the distemper, in some proper place, until they are recovered and cleansed from the said distemper, or have performed a suitable quarantine.

SEC. 17. Whenever the small-pox, or other contagious or infectious distemper, shall break out in any house, and the infected persons be confined to such house, the town shall be at the expense of guarding the same, and the owner at the charge of cleansing the same, to be settled by the town council, which charges of cleansing, upon refusal to pay the same, shall be recovered by the town treasurer.

SEC. 18. In case the small pox, or other contagious or infectious distemper, shall break out in any house or family in any town, the town council thereof may remove any inhabitants of said town, visited with the small-pox, or other contagious or infectious distemper, to the hospital in said town, or other convenient place, in order to prevent the spreading of the infection: or otherwise, at their discretion, place a guard around the dwelling-house of the infected person, as to them shall seem necessary.

SEC. 19. So long as the town council of any town shall endeavor to prevent the spreading of the small-pox, any persons who shall visit any person suspected to have the small-pox, or shall go into the house where suspected persons are confined, without a license first had from the town council of the town, or of the attending physician, shall forfeit for every such offence twenty dollars; one-half to the use of the town where such offence is committed, and the other half to the use of the person who shall sue for the same; and such persons, on information of their offence, shall be liable to be confined until they are suitably aired and cleansed, or have performed suitable quarantine, at the discretion of the town council to whom complaint of the same shall be made.

SEC. 20. Whenever any person shall be found to be infected with the small-pox, it shall be the duty of the householder in whose house such infected person may be or reside, within twenty-four hours thereafter, to place a white flag not less than three feet in length and two in breadth, with the words "small-pox," in large black letters on both sides thereof, and so suspended as to be easily read, at or near the front door or principal entrance to such house, on the outside thereof, and to keep said flag up so long as there shall be any danger of taking the infection from said house.

SEC. 21. Every person who shall be convicted of wilfully and purposely spreading the small-pox, or other contagious or infectious distemper, within this State, shall be imprisoned for one year; and if any person shall die in consequence of the spreading of the small-pox, or other contagious or infectious distemper, as aforesaid, the person who shall be convicted of wilfully and purposely spreading the same, as aforesaid, shall be fined not exceeding five thousand dollars, and be imprisoned not more than five years, nor less than one year.

SEC. 22. If any physician, surgeon, or any other person lawfully required by any town council to do any duty relating to the prevention of the spreading of the small-pox, or executing any part of this chapter, shall refuse or neglect to perform the same, the performance thereof being in his power, such physician, surgeon, and other person, shall, for every offence, be fined forty dollars.

SEC. 23. In case any person shall hereafter be sick of any malignant, pestilential, or infectious disease, in any town, so as to endanger his life by being removed, or in case it shall appear that the disease be so spread that the atmosphere, in the judgment of the town council, has become so contaminated as to endanger the lives of those persons who reside or go into the neighborhood of the sick, the town council of such town may cause all such persons within such neighborhood to be notified to remove therefrom within three days; and if after that time any person shall remain there, the said town council may cause him to be forthwith removed at his own expense: *Provided*, that the expense of the removal of the poor, or such as are unable, in the judgment of the town council, to remove themselves, shall be paid out of the town treasury.

SEC. 24. The town councils in the several towns shall provide annually for the gratuitous vaccination of the inhabitants thereof.

SEC. 25. Such councils shall contract with and provide a suitable number of vaccinators to vaccinate as aforesaid; and order the treasurers of the several towns respectively to pay them such compensation as may be previously agreed upon; and the said vaccinators shall give due and reasonable notice of the time and place of meeting for the purpose of vaccination.

SEC. 26. Such vaccinators, as soon after fulfilling said contract as may be convenient, shall place in the several town clerks' offices a book, in which shall be by them respectively recorded, in a fair and legible hand, the name and age of every patient by them vaccinated as aforesaid, and also such other remarks and observations as they may deem useful.

SEC. 27. Such clerks shall safely keep said books for the accommodation of such vaccinators and others, without any compensation, and deliver the same over to their successors; but they may charge lawful fees for searching the same, or for any copies.

CHAPTER 75.

OF QUARANTINE.

SECTION 1. Each seaport town, or the town council thereof, may appoint a health officer for such town, who shall visit all vessels which shall be subject to examination or quarantine, and carry into execution all regulations established by the town council, and shall be at all times accountable to said town council, and shall receive for his services such compensation as said council may allow, to be paid by the owners, agents, or commanders, of such vessels as may be subjected to quarantine or examination.

SEC. 2. Such town council shall cause to be published in one or more newspapers printed in this State, within or nearest the town wherein such rules and regulations shall be adopted, and at the proper cost and expense of the town, all rules and regulations made by them respecting quarantine.

SEC. 3. They shall prescribe from time to time the several ports, places, or countries, from which vessels arriving shall be subject to examination or quarantine.

SEC. 4. They shall designate the particular place in their harbor, bay, or river, adjacent to such town, where all ships or vessels arriving, subject to examination or quarantine, shall come to anchor; and shall define the limits of such quarantine ground, and assign the time for which such ships or vessels shall be detained, and where and how unladen.

SEC. 5. They may appoint a sentinel, who shall be paid by the town and be stationed in some convenient place on shore, or in some boat or vessel properly situated, to hail all ships or vessels which may arrive in such river, bay, or harbor; and if such sentinel shall find any ship or vessel is subject to quarantine, he shall direct the commander thereof to come to anchor within the limits of such quarantine ground, and there remain until visited by the health officer, and to place a signal in said vessel's shrouds in such manner as to be seen at a proper distance.

SEC. 6. Every commander of a ship or vessel who shall, upon being hailed and directed by such sentinel, refuse or neglect to bring his ship or vessel to anchor within the limits as above described, shall be fined not exceeding five hundred dollars, nor less than twenty dollars, to the use of the town.

SEC. 7. The town council may order such ship or vessel to be anchored on the quarantine ground, at the expense of the owners, master, or commanding officer thereof, there to remain until legally discharged therefrom.

SEC. 8. Every person who shall leave any ship or vessel under order of quarantine, without permission from the health officer or the town council of such town, shall forfeit not exceeding twenty dollars; and said town council may order such person to be returned on board of such vessel, there to remain until said council order him to be dismissed.

SEC. 9. If any vessel shall arrive in the waters of this State, bound to the port of Providence, at any time while the quarantine regulations of said city are in force, no person on board such vessel shall enter into the city of Providence, the village of Pawtuxet, or the compact part of the town of Cranston, until such vessel shall have been visited and examined by the health officer of said city, and permission shall have been given by such health officer, or by the board of aldermen of said city, to such person, to enter therein.

SEC. 10. Every person so entering into said city, village or town as aforesaid, without such permission first had and obtained, shall forfeit not exceeding twenty dollars; and said board of aldermen may cause such person to be returned to such vessel in case she is under quarantine, there to remain until permitted to depart therefrom.

SEC. 11. Every sheriff, deputy sheriff, town sergeant, and constable shall carry the rules and regulations of the town council within his precinct, into effect.

SEC. 12. Every forfeiture for the violation of any of the provisions of this chapter shall be sued for in the name of the town treasurer of the town where the offence was committed, and shall enure to such town.

CHAPTER 76.

OF CONTAGIOUS DISEASE AMONG CATTLE AND OTHER ANIMALS.

(As amended April, 1878.)

SECTION 1. Every person bringing into this State any neat-cattle or other animals which he knows to be infected with any infectious or contagious disease, or who shall expose such cattle or other animals, known to him to be so infected, to other cattle and animals not infected with such disease, shall be fined not less than one hundred dollars, nor more than five hundred dollars.

SEC. 2. The town councils of the several towns may pass such ordinances as they may think proper, to prevent the spread of infectious or contagious diseases among cattle and other animals within their respective towns, and may prescribe penalties for the violation thereof, not exceeding twenty dollars for any one offence.

SEC. 3. *Repealed at January Session, 1878.*

SEC. 4. The State Board of Health may prohibit the introduction of any cattle or other domestic animals into this State. And every person who shall bring, transport, or introduce any cattle or other domestic animals into this State, after said State Board of Health, or any one of them, shall have issued an order forbidding the same, or after the said Board shall have published for five successive days an order in such newspapers published in this State as the Board may direct, forbidding such introduction, shall be fined not more than three hundred dollars for every offence; and every officer or agent of any company, or other persons who shall violate such order, shall be subject to the fine aforesaid. In case of the introduction into this State of a number of cattle or other domestic animals, contrary to the orders of such Board, the introduction of each animal shall be deemed a separate and distinct offence.

SEC. 5. Said Board shall endeavor to obtain full information in relation to any contagious disease which may prevail among cattle or other domestic animals near the borders of the State, and shall publish and circulate such information at their discretion; and should any such disease break out, or should there be reasonable suspicion of its existence among cattle or other domestic animals in any town in this State, they shall examine the cases, and publish the result of their examination, for the benefit of the public.

SEC. 6. Said Board may appoint suitable and discreet persons, on or near the several highways, turnpike-roads, railroads, and thoroughfares in the State, who shall inquire into all violations of this chapter, and report the same to the Board for immediate prosecution.

SEC. 7. If any person, during the existence of said Board, shall sell, or offer to sell, any cattle or other domestic animals, or any part or parts thereof, known to him to be infected with any contagious disease, or with any disease dangerous to the public health, or shall sell, or offer to sell, any milk from any such cattle or other domestic animals, he shall be fined not more than one thousand dollars, or be imprisoned not exceeding two years, or both, at the discretion of the court.

SEC. 8. The said Board may make all necessary regulations for the prevention, treatment, cure, and extirpation of such disease; and the value of all cattle or

other domestic animals killed by the written order of the Board, shall be appraised by three disinterested persons to be appointed by the Board, such appraisal to be made just before the cattle or other domestic animals are killed, and the amount of such appraisal shall be paid by the State to the owner of such cattle or other domestic animals; and every person who shall fail to comply with any regulation by them so made, shall be fined not more than three hundred dollars, or be imprisoned not more than one year.

SEC. 9. Whenever the said Board shall make and publish any regulations concerning the extirpation, cure, or treatment of cattle or other domestic animals infected with, or which have been exposed to, any contagious disease, such regulations shall supersede the regulations made by the authorities of the several towns and cities upon the same subject; and the operation of such regulations made by said authorities shall be suspended during the time those made by the Board, as aforesaid, shall be in force.

SEC. 10. The said State Board of Health shall keep a record of their doings, and make report of the same to the January Session of the General Assembly next after the time of their appointment, unless sooner required by the Governor.

SEC. 11. All orders, appointments, and notices from the said Board, except the order of notice provided for in section 4, shall bear the signature of the president or chairman, and secretary.

SEC. 12. Every prosecution for a violation of any of the provisions of this chapter, shall be commenced within thirty days from the commission thereof.

CHAPTER 77.

OF THE REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

(As amended April, 1878.)

SECTION 1. The town clerks of the several towns, or in lieu thereof, any person whom the board of aldermen of any city, or the town council of any town, may appoint for that purpose, are hereby authorized and required to obtain, chronologically record and index, as required by the forms prescribed by the third section of this chapter, all information concerning births, marriages, and deaths, occurring among the inhabitants of their respective towns; and on or before the first Monday of March, annually, to make duly certified returns thereof to the Secretary of the State Board of Health, for each year, ending on the thirty-first day of December, accompanying the same with a list of those individuals, required by law to make returns to him, who have neglected the same, and with such remarks relating to the object of the law, as they may deem important to communicate.

SEC. 2. The Secretary of the State Board of Health shall receive the returns made in pursuance of the preceding section, and annually make and publish, not exceeding one thousand copies, a general abstract and report thereof, in form as

prescribed by section third of this chapter. The Secretary of State shall then cause said returns to be arranged, full alphabetical indices of all the names to be made, the whole to be bound in convenient sized volumes, and carefully preserved in his office, for which he shall receive the sum of fifty dollars.

SEC. 3. The blank forms required to carry out the provisions of this chapter shall, on application, be furnished by the Secretary of the State Board of Health, to clergymen, physicians, undertakers, town clerks, clerks of the Society of Friends, and other persons requiring them, substantially after the following forms, viz.: The record of a birth shall state the date and place of birth, name and sex of the child, whether living or still-born, the name and surname, color, occupation, residence, and birth-place of the parents, and the time of recording, so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence, and official station of the person by whom married, names and surnames of the parties, age, color, occupation, and residence of each, condition (whether single or widowed), what marriage, if second, third, or other marriage, the occupation, birth-place, and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of deceased, the sex, color, and condition (single or married), age, occupation, place of death, place of birth, names and birth-place of parents, disease, or cause of death, and the time of recording, so far as can be ascertained.

OF MARRIAGES.

SEC. 4. Every Society of Friends, clergymen and all others, authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same on or before the second Monday of every month, for the last preceding month, to the clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the authority about to solemnize it, or to the clerk of a Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed in the third section of this chapter.

OF BIRTHS.

SEC. 5. The clerk of every town shall, annually, in the month of January, collect the facts required by section third of this chapter, in relation to all children born in the town during the year ending the thirty-first day of December next preceding, and for each full report of a birth so obtained, the clerk shall receive ten cents, to be paid by the town in which the birth is recorded.

OF DEATHS.

SEC. 6. Whenever any person shall die in the State, it shall be the duty of the physician attending in his or her last sickness, within forty-eight hours after the death, to leave with the family, if any, or persons having the care of the deceased, or to give to the undertaker or person who conducts the funeral, a certificate stating the name of the deceased, the date of the death, and the disease or cause of death.

OF UNDERTAKERS.

SEC. 7. There may be appointed, by the town authorities of every town, a sufficient number of persons to act as undertakers, removable at the pleasure of the authorities.

SEC. 8. The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb the body of any deceased person, shall obtain the facts, required by section third of this chapter in relation to deaths, concerning such deceased person, together with the physician's certificate of the cause of the death, if a physician was in attendance, and on or before the second Monday of the next succeeding month, shall make a return of the facts obtained, together with the physician's certificate, to the clerk of the town in which the death occurred.

SEC. 9. Any town may enact municipal laws, more effectually to attain the objects herein contemplated: *Provided*, they do not conflict with the main and specific object of this act, viz.: to procure the most perfect registration.

OF FEES.

SEC. 10. The town clerks, or persons recommended and appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries: *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall faithfully perform the duties prescribed by this chapter, shall not be less than five dollars. Undertakers and others making returns of deaths as required in section eight of this chapter shall receive for each full report of a death made to the town clerk, five cents in the cities of Providence or Newport, and ten cents in the other towns of the State.

SEC. 11. If any clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other persons, shall wilfully neglect or refuse to perform any of the duties imposed on, or required of him, by this chapter, he shall, at the discretion of the court trying the cause, be fined not exceeding twenty dollars for each offence, one-half thereof to the use of the town in which the offence shall occur, the other half to the use of the person who shall complain of the same.

SEC. 12. In order that it may be more surely ascertained that no clergyman, physician, coroner, undertaker, or clerk of the Society of Friends, neglects to make the returns specified in this chapter, each of the said parties shall cause his name and residence to be recorded in the clerk's office of the town where he resides.

SEC. 13. No letters of administration, or letters testamentary, shall be granted by any court of probate, upon the effects or estate of any person, until the death of such person, or the facts from which the same is presumed, shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. Such books or registers, or a certificate duly certified by the town clerk, or person appointed as aforesaid, as containing a full copy of the record

of any marriage, birth, or death, shall hereafter be admitted in any court in this State, as *prima facie* proof of any marriage, birth, or death.

SEC. 15. Births, marriages, and deaths of non-residents, shall be distinguished from those of residents, in the returns, by being arranged separately.

SEC. 16. The Secretary of the State Board of Health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary, to effect the object of this chapter.

SEC. 17. *Repealed January Session, 1878.*

SEC. 18. The town clerks or other officers appointed under this chapter, to collect, record, and return the births in the several towns, shall receive fees therefor as follows: For collecting the facts required in relation to births, fifteen cents each; for making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return.

SEC. 19. The returns required to be made by clerks of the supreme court, in relation to divorces, to the Secretary of the State Board of Health, or a prepared abstract thereof, shall be published in the annual report upon the births, marriages, and deaths in the State.

CHAPTER 119.

OF MEDICINES AND POISONS.

SECTION 1. No person, unless a registered pharmacist, or registered assistant pharmacist in the employ of a registered pharmacist, or unless acting as an aid under the immediate supervision of a registered pharmacist, or a registered assistant pharmacist, within the meaning of this chapter, shall retail, compound, or dispense medicines or poisons, except as hereinafter provided.

SEC. 2. Every person, in order to be a registered pharmacist or a registered assistant pharmacist, within the meaning of this chapter, shall be either a graduate in pharmacy, a practicing pharmacist, or a practicing assistant in pharmacy. Graduates in pharmacy shall be such as have obtained a diploma from a regularly incorporated college of pharmacy, and shall have presented satisfactory evidence of their qualifications to the State Board of Pharmacy. A practicing pharmacist shall be deemed to be a person who, on the 24th day of March, A. D. 1871, kept, and continued thereafter to keep an open shop for compounding and dispensing the prescriptions of medical practitioners, and for the retailing of drugs and medicines, and who shall give to the State Board of Pharmacy satisfactory evidence of his qualifications, and shall have declared his intentions in writing of keeping open shop for the compounding of prescriptions and the retailing of drugs and medicines; and such other persons as shall have given to the State Board of Pharmacy satisfactory evidence of their qualifications, and shall have declared their intentions in writing of keeping open shop for the compounding

of prescriptions and the retailing of drugs and medicines. A practicing assistant in pharmacy shall be deemed to be a person who shall have served three years' apprenticeship in a shop where the prescriptions of medical practitioners are compounded, and shall have passed a satisfactory examination before the State Board of Pharmacy.

SEC. 3. The State Board of Pharmacy shall consist of seven persons, to be appointed by the Governor from the registered pharmacists of the State, and shall hold office for the term of three years, and until their successors are appointed. The members of the pharmaceutical board of the State, appointed by the Governor, shall constitute, for the term for which they were appointed, the State Board of Pharmacy, within the meaning of this chapter. On the first of July, A. D. 1873, and in every third year thereafter, the Governor shall appoint the State Board of Pharmacy; and in case of vacancy at any time, arising from resignation, death, or removal from the State, the Governor shall have power to fill such vacancy from the registered pharmacists of the State. Four members of said board shall constitute a quorum. Said board shall organize by the election of a president and secretary; both of whom shall sign all certificates and other official documents. Said board shall meet twice a year, and shall have power to make by-laws and all necessary regulations, not repugnant to law, for the proper fulfilment of their duties. The secretary of said board shall also be registrar of pharmacists. The duties of said board shall be, to examine all applicants for registration; to direct the registration by the registrar of all persons properly qualified or entitled thereto, and report annually to the General Assembly on the condition of pharmacy, together with the names of all registered pharmacists and assistant pharmacists. The duties of the registrar of pharmacists shall be, to keep a book in which shall be entered, under the supervision of the State Board of Pharmacy, the name and place of business of every person who shall apply for registration. The registrar shall note the fact against the name of any registered pharmacist, or assistant pharmacist, who may have died or removed from the State, or disposed of or relinquished his business, and shall make all necessary alterations in the location of persons registered under this chapter.

SEC. 4. Every person applying for examination and registration shall pay to the State Board of Pharmacy ten dollars, and on passing the examination required, shall be furnished, free of expense, with a certificate of registration. Every registered assistant pharmacist may, with the consent of said board, be entitled to registration as a registered pharmacist, and shall be furnished with a certificate of registration, for which certificate he shall pay the registrar one dollar. Every certificate issued by said board shall be renewed annually, for which renewal one dollar shall be paid to the registrar. The fees received for examinations, registration, and certificates, shall be appropriated to defray the expenses of the State Board of Pharmacy.

SEC. 5. Every person, not a registered pharmacist, who shall keep open shop for the retailing and dispensing of medicines and poisons; or who shall take, use, or exhibit the title of registered pharmacist; and every person who shall violate any of the provisions of this chapter, shall, upon the first conviction, be fined fifty dollars, and upon the second, and every subsequent conviction, shall be fined one hundred dollars; and all fines recovered shall enure, one-half to the State,

and the other half to the complainant: *Provided, however*, that in towns or parts of towns where there is no registered pharmacist within three miles, it may be lawful for any person to sell the usual domestic medicines put up by a registered pharmacist, and marked with his label; such person procuring annually a certificate from the State Board of Pharmacy therefor, and paying one dollar for such certificate.

SEC. 6. Nothing hereinbefore contained shall apply to any practitioner of medicine, who does not keep open shop for the retailing, dispensing, or compounding of medicines or poisons, nor prevent him from administering or supplying to his patients such articles as he may deem fit and proper; nor shall it interfere with the making and dealing in proprietary medicines (popularly called patent medicines), unless such medicines be wholly or in part composed of some of the articles enumerated in schedule A, of this chapter; nor with the business of wholesale dealers in supplying medicines and poisons to registered pharmacists and physicians, and for use in the arts.

SEC. 7. No person shall hereafter sell, either by wholesale or retail, any of the poisons enumerated in schedule A, of this chapter, without distinctly labelling the bottle, box, vessel, or paper, and wrapper or cover in which said poison is contained, with the name of the article, the word POISON, and the name and place of business of the seller; and every registered pharmacist selling or dispensing any of said poisons shall first enter in a book, to be kept for that purpose only, and subject always to inspection by the State Board of Pharmacy, or any officer or agent thereof, or other proper authority, and to be preserved for at least five years, a record of the same in accordance with schedule B, of this chapter: *Provided*, that if any of said poisons form a part of the ingredients of any medicine or medicines compounded in accordance with the written prescription of a medical practitioner, the same need not be labelled with the word poison; but all prescriptions, whether or not composed in part or in whole of any of said ingredients, shall be carefully kept by the pharmacist on a file or in a book, used for that purpose only, and numbered in the order in which they are received or dispensed, and every box, bottle, vial, vessel, or packet containing medicines so dispensed, shall be labelled with the name and place of business of the registered pharmacist so dispensing said medicine, and be numbered with a number corresponding with that on the original prescription, retained by said pharmacist on such book or file. Such prescription shall be preserved at least five years, and shall be open to the inspection of the writer thereof, and a copy shall be furnished free of expense, when demanded by either the writer or the purchaser thereof.

SEC. 8. Every person who shall knowingly adulterate, or cause to be mixed, any foreign or inert substance with any drug or medicinal substance, or any compound medicinal preparation recognized by the pharmacopœia of the United States, or of other countries, as employed in medicinal practice, with the effect of weakening or destroying its medicinal power, or who shall sell the same knowing it to be adulterated, shall, in addition to the penalties prescribed in section five hereof, forfeit to the use of the State, all articles so adulterated found in his possession, and shall be deprived of the right of practicing as a pharmacist in this State thereafter. Whenever complaint shall be made of any violation of the provisions of this section, the State Board of Pharmacy, on being notified

CHAPTER 289.

AN ACT IN AMENDMENT OF CHAPTER 74, OF THE GENERAL STATUTES, "OF REGULATIONS FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES."

It is enacted by the General Assembly as follows:

SECTION 1. Every physician, householder* or other person, having knowledge of the existence of small-pox in any town shall immediately give information thereof to the town clerk of the town in which the person sick with the small-pox resides, or may be, and in cities shall give like information to the superintendent of health.

SEC. 2. Whenever the town clerk of any town shall have knowledge, or shall have received information as provided in the preceding section of the existence of small-pox in his town, he shall forthwith give or cause notice thereof to be given to the town council of such town, at the expense of the town, to be audited and allowed by the town council.

SEC. 3. Every physician, householder, town clerk, or other person, violating any provision of the two preceding sections, shall pay a fine of twenty dollars, or be imprisoned not exceeding ninety days, either or both in the discretion of the court.

SEC. 4. Whenever any person shall be found to be infected with the small-pox any town, the town council of such town and the superintendent of health in the several cities, shall, within twenty-four hours after receiving information thereof, cause a white flag with the words "SMALL-POX" in black letters, not less than six inches in length, inscribed thereon, so suspended or fastened as to be easily read, to be placed at or near the front door or principal entrance of the building in which such infected person may be or reside, and to keep such flag so placed so long as there shall be any danger of taking the infection from said building.

SEC. 5. Every person who shall deface or remove any such flag without the permission of such town council or superintendent of health, shall pay a fine of twenty dollars and be imprisoned not exceeding ninety days.

SEC. 6. Every person in any house where there is any one sick with the small-pox or other contagious or infectious disease, or who is in any small-pox hospital, who shall voluntarily leave the same without a permit from the town council, or the physician employed by such town council, or from the superintendent of health in cities, shall pay a fine of twenty dollars and be imprisoned not exceeding ninety days.

SEC. 7. This act shall take effect from and after its passage, and all acts and parts of acts inconsistent herewith are hereby repealed.

CHAPTER 488.

AN ACT IN AMENDMENT OF CHAPTER 77, OF THE GENERAL STATUTES, "OF THE REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES."

It is enacted by the General Assembly as follows:

SECTION 1. The words in Section 1 of said Chapter 77, "upon the written recommendation of an authorized committee of the Rhode Island Medical Society," and the words in Section 10 of said chapter "recommended and," are hereby stricken out.

SEC. 2. Section 6 of said Chapter 77 is hereby amended so as to read as follows: "Whenever any person shall die, or any still-born child shall be brought forth in this State, it shall be the duty of the physician attending at such bringing forth or last sickness, if any physician so attended, within forty-eight hours after such death or bringing forth, to leave with the family, if any, or person having the care of the deceased, or the person bringing forth such still-born child, or to give to the undertaker or person who conducts the funeral, a certificate stating in case of a death the name of the deceased, the date of the death and the disease or cause of the death, and in case of the bringing forth of a still-born child, the date and the cause of such child being brought forth still-born."

SEC. 3. Section 8 of said chapter is amended so as to read as follows: "The undertaker, or the person who shall conduct a funeral, or who shall bury or deposit in a tomb, or who shall remove from this State or otherwise dispose of the remains of any deceased person or still-born child, shall first obtain the physician's certificate required by Section 6 of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the facts required by Section 3, as hereby amended, on or before the second Monday of the next succeeding month, to the clerk of the town where such death or bringing forth took place."

SEC. 4. Section 14 of said chapter is amended so as to read as follows: "The person appointed as provided in Section 1 of this chapter, shall be entitled to have the custody of all records of births, deaths or marriages of the town or city for which he is appointed, whether made under the statute, now in force or any former statute, and a certificate signed by him as town or city registrar, certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in his custody, shall be admitted as *prima facie* proof of such marriage, birth or death.

SEC. 5. This act shall take effect from and after its passage.

CHAPTER 680.

AN ACT TO ESTABLISH A STATE BOARD OF HEALTH.

It is enacted by the General Assembly as follows :

SECTION 1. The Governor, with the advice and consent of the Senate, shall appoint six persons, two from the county of Providence, and one from each of the other counties, who shall constitute the State Board of Health. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by this State. The Governor may remove any member for cause, at any time, upon the written request of two-thirds of the Board.

SEC. 2. The six persons first appointed, shall be appointed for one, two, three, four, five and six years respectively, and hereafter, the Governor, with the advice and consent of the Senate, shall appoint one member of the Board annually, for the term of six years from the first day of July. Any appointment to fill a vacancy, shall be for the remainder of the term.

SEC. 3. The Board shall take cognizance of the interests of life and health among the citizens of the State; they shall make investigations into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall faithfully do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the State. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the State, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the General Assembly, or by the Governor when the General Assembly is not in session.

SEC. 4. The State Board of Health shall also investigate the subject of diseases among cattle or other animals, and perform all the duties which have been delegated to the Board of Cattle Commissioners in Chapter 76, of the General Statutes of the State.

SEC. 5. Section 3, of Chapter 76, of the General Statutes, is hereby repealed, and the Board of Cattle Commissioners heretofore constituted under authority of said section, is hereby abolished.

SEC. 6. In every section of Chapter 76, of the General Statutes, where the word "commissioners" occurs, it shall be construed to mean State Board of Health.

SEC. 7. The State Board of Health shall receive the returns of births, marriages, deaths and divorces, and shall prepare the annual report upon the registration of the same as now required by law, but after the report is prepared, the returns shall be deposited in the office of the Secretary of State, to be bound and indexed by him as heretofore.

SEC. 8. Wherever the words "Secretary of State" occur in sections 1, 2, 3, 16 and 19, of Chapter 77, of the General Statutes, they shall be construed to mean Secretary of the State Board of Health, and in the sixth line of Section 2, of said

chapter, the word "he" shall be construed to mean Secretary of State. Section 17, of Chapter 77, of the General Statutes is hereby repealed.

SEC. 9. The Board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the Board, except the Secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the Board, shall be paid by the State.

SEC. 10. The Board shall elect a well qualified physician as their Secretary.

SEC. 11. The Secretary shall perform and superintend the work prescribed in this law and such other duties as the Board may require, and he shall receive such salary, not in excess of twelve hundred dollars per annum, as the Board may determine. He shall hold his office at the pleasure of the Board, but may be removed at any regular meeting by a majority vote of the members thereof.

SEC. 12. The Governor shall provide a suitable office for the Board, in the city of Providence, and the actual expenses of the Board and of the members thereof, when certified by the Chairman and approved by the Governor, shall be paid from the treasury of the State.

SEC. 13. The Board shall make a report in print, to the General Assembly, annually in the month of January, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the State as they shall deem important.

SEC. 14. All acts and parts of acts inconsistent herewith are hereby repealed.

SEC. 15. The several town councils and boards of aldermen shall still be *ex-officio* boards of health in their respective towns, as is now by law provided; *provided, however*, that the city council of any city may appoint a board of health for such city, which shall have all the powers and duties now conferred by law upon the board of aldermen as a board of health.

NOTE.—There are, also, in addition to the preceding Chapters, other Statutes having relation to the public health and protection of life, and providing for the inspection of milk, of meats, of kerosene and other coal oils, of saleratus, soda, cream of tartar, etc.

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